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COMPUTERWORLD

Microsoft pumps client/server

Advanced Server price slashed in bold bid to win NetWare users

By Elisabeth Horwitt
BEDMOND, WASH.

Microsoft Corp.'s decision to give away its Windows NT Advanced Server client software will help entice first-time corporate buyers to choose NT over Novell, Inc.'s NetWare as their primary client/server platform, observers said last week.

Less clear, however, is whether bargain-basement prices will help Advanced Server carve a significant slice out of Novell's 68% to 70% share of the overall network operating system installed base.

Furthermore, pricing will be only one consideration — and possibly a minor one — for companies choosing a network operating system, according to one user, several analysts and, of course, Novell.

"Irrespective of dollar amounts, NetWare does outperform Advanced Server in file and print services, although not as an application server," said Louis Kahn, chief of network operations at the National Immunization Program in Atlanta.

Added John Donovan, a senior analyst at WorkGroup Technologies, Inc. in Hampton, N.H.: "Considerations like durability and reliability, administration and management tools are all tremendously important [to users], and Novell is very far ahead of NT on those scores."

Microsoft announced last week that client networking software

Microsoft, *page 10*

PC price war

Rivals may squeeze Intel

By Michael Fitzgerald

Intel Corp. is staring straight at a pincerlike move that could force it to lower its prices and shift its Pentium strategy in 1994.

Surrounding Intel are the PowerPC initiative from IBM, Apple Computer, Inc, and Motorola, Inc. and Cyrix Corp.'s coming M1 chip design, which that company plans to detail at the Microprocessor Forum on Oct. 18.

The first PowerPC systems started shipping last week. The various PowerPC partners have the potential to ship well over 1 million systems next year, according to analyst estimates. That could make PowerPC a solid volume competitor to Pentium, which analysts expect will ship in the 2 million to 3 million unit range in 1994.

Staying on schedule

Moreover, the PowerPC alliance remains on schedule for the second part of the project, the 603 chip. Sources said the partners will announce at the Microprocessor Forum that they have developed the first implementation of the chip.

Intel also will face pressure from Cyrix. Like the Pentium, the M1 features a superscalar design. But unlike the Pentium, it does not

Intel, *page 7*

CITY LIMITS

Reinventing government? Local-level IS chiefs such as the city of Phoenix's Vivienne Dacey are trying, but empty coffers and regulations are blocking their efforts.

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UNIX EXPO

- NetWare gets Unix spin; X/Open doesn't get USL code — yet. *Page 14*
- First PowerPCs arrive. *Page 16*
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Wellfleet adds IBM flavor to router recipe

By Joanie M. Wexler
DANVERS, MASS.

■ Wellfleet Communications, Inc. last week gave users a premature peek into the next version of its router software, an IBM internetworking-oriented upgrade that finally unites old and new Wellfleet platforms.

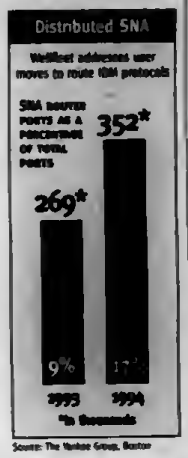
The software, due out in November, includes a list of IBM protocol support and network management enhancements aimed at the heart of user internetworking challenges today: force-fitting IBM host traffic onto LAN internetworks.

The new release will also bring the long-touted benefits of Wellfleet's 18-month-old Backbone Node family, such as software fault tolerance, to users of its older VME-based line, according to documents circulating at the Wellfleet user group meeting here last week. The VME-based routers are installed at the majority of Wellfleet accounts today.

Release 7.6 represents the first box on the market to support Data Link Switching, the IBM-originated but now industry-driven standard scheme for merging SNA traffic onto distributed internetworks.

For IBM-heavy shops, Data Link Switching "addresses a legacy environment that now requires a whole extra support structure,"

Wellfleet, *page 12*



Desktop application development

Windows 4.0, OLE 2.0 to test developer mettle

By Michael Vizard and Ed Scannell
BEDMOND, WASH.

As Microsoft Corp. begins its transition to Windows 4.0 and Version 2.0 of its Object Linking and Embedding interface, the coming year is likely to be remembered as one of the most trying times for Windows developers.

Microsoft currently plans what amounts to a redesign of the Windows graphical user interface in Windows 4.0, known as Chicago. It will also deploy an object-oriented programming environment in the guise of OLE 2.0.

The prospect of a redesigned Windows interface, which will steadily evolve throughout its upcoming beta cycle, presents developers with a significant challenge as they march through their own development projects.

Windows 4.0 simplifies the task of sharing application data by allowing users to drag icons across the screen

For example, a developer planning to deploy an application in 1994 is currently working with the Windows 3.1 interface. But a developer at a rival company may opt to start working with the user interface in Windows 4.0 early next year. Doing so would give the second developer a nicer-looking, native Windows 4.0 application as early as six months after the first developer delivered a Windows 3.1 application.

"Microsoft is saying that Windows 3.1 ap-

Windows development, *page 8*

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■ The Society for Information Management works with vendors to define terms in software licensing debate. *Page 6*

■ Oracle forges partnerships with traditional mainframe utilities makers to provide customers with mainframe-caliber systems management tools. *Page 6*

■ IBM will soon unveil software to manage distributed LAN Server systems via either host or OS/2-based NetView. *Page 10*

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■ Novell tightens links between UnixWare and NetWare, including expansion of a certification program to include UnixWare. *Page 14*

ADVANCED TECHNOLOGY

■ It can be a long way from concept to product, as is clear from a catch-up look at some of the leading-edge technologies we've covered during the past three years. *Page 32*

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Alan Levinson

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■ Information systems groups in local government battle both cost cuts and bureaucratic red tape. *Page 132*

INTEGRATION STRATEGIES

■ Integration projects aren't something you can just hand off. Even if you find a great integrator, which takes some effort, you still have to manage the process all the way. *Page 121*

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■ If you know one version of Unix, learning another version is not a big stretch. *Page 140*

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■ A former consultant discloses shortcuts and billing games that hired advisers sometimes play. *Page 149*

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■ It's survival of the fittest in the internetworking market. *Page 157*

COMMENTARY

■ IBM researchers may have discovered a way to exponentially increase disk drive capacity without upping power drain, according to Charles Babcock. *Page 6*

■ Client/server looks wonderfully easy when you consider only the client side, Paul Gillin says. Most of the complex parts are found on the other side of the slash mark. *Page 36*

■ Information technology could be used to simplify the way we do business, Michael Schrage writes. But too often, we're using it to manage unnecessary complexity. *Page 37*

Tom Roosevelt

Integration Strategies: *Michelle Wells at KFC says systems integrators need up-close exposure to your business.* **Page 121**

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Executive Briefing

Better management through consistency is an idea that a couple of networking product vendors are saluting this week. Wellfleet's new router software release will cater to mixed IBM/LAN shops and unites features across its older and current platforms. *Page 1*. **In the meantime, 3Com has announced a set of applications that will unify the management of its large variety of hubs, routers and network adapters.** *Page 67*

Champing at the bit for multimedia capability? Developments on several fronts will soon give you more to work with. HP is scrapping its line of X Window System terminals in favor of a new multimedia-capable line called Envizex. *Page 53*. Oracle is road-testing massively parallel databases capable of manipulating video and sound in tests of interactive TV applications by Bell Atlantic and US West. Pieces of this product line, dubbed Media Server, are expected to ship to developers in January. *Page 85*. And disk drive maker Micropolis has introduced the first magnetic drives designed for digital audio/video applications. *Page 44*

Some potential customers are worried about the sizable hardware commitment that Microsoft's SQL Server for Windows NT might require. *Page 49*. This issue spells opportunity for Netpower, a start-up funded by Silicon Graphics, Stanford University and venture capitalists. Netpower will announce today that it is shipping a RISC-based server for Windows NT, and it will market client and server versions together with Microsoft. *Page 61*

Nothing is going to make client/server as safe or easy as the marketing hype would have you believe (*Page 36*), but some alliances are at least bringing some familiar utilities and mainframe capabilities into this rough territory. Oracle has provided APIs for its database to Legent, BMC and five other large-system specialists in systems management tools. *Page 6*. Legent has also allied with HP to produce an integrated suite of tools spanning mainframe and Unix client/server environments for performance and resource management. And in another combination move designed to allay concerns about merging legacy systems with open or distributed platforms, Sun and Amdahl have announced plans to collaborate. *Page 24*

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Lotus overhauls CC:Mail

Plans to meet user demands for management, migration

By Lynda Radosevich
SAN FRANCISCO

Lotus Development Corp.'s blueprint for modernizing CC:Mail signals that it has recognized the most urgent needs of CC:Mail customers: management and administration features and a method to migrate to client/server platforms.

Officially unveiled at the annual CC:Mail user conference here last week, parts of the Lotus strategy, however, are long on intention and short on details. This is leading some customers and analysts to question whether Lotus can follow through on its promises in a timely manner, something with which the company often has difficulty (see story page 16).

For instance, Lotus executives echoed users' complaints by conceding that CC:Mail needs better wide-area management administration. The company also committed to providing those management features, but it did not define how or when it would be done.

"The good news is they articulated a strategy that makes sense because it gives us a growth path," said Larry Quinlan, manager of LAN services at CC:Mail user site Deloitte & Touche in Nashville.

Highlights of the CC:Mail game plan included an upcoming messaging server called the Lotus Communications Server (LCS). Based on Notes technology, it will use native X.400 and Simple Mail Transport Protocol (SMTP) transports and support the X.500 directory protocol [CW, Sept. 20]. It will operate on Microsoft Corp.'s Windows NT, Unix and OS/2 and will function as a Novell, Inc. NetWare Loadable Module. By supporting various application programming interfaces, the server will work not only with Notes and CC:Mail clients but also with archrival Microsoft's Mail.

"Lotus is making major changes in terms of 'openness,'" said David Marshak, an analyst at the Patricia Seybold Office Computing Group, a consultancy in Boston.

Doing so may allow Lotus to hold off a challenge from Microsoft, which is developing an X.400-based Enterprise Messaging Server (EMS) that runs only on Windows NT. For customers that do not want to be forced into using NT but are accustomed to Microsoft's Mail interface, the Lotus server could provide back-end services, Marshak said.

May miss the mark

But Lotus officials were unable to predict how parts of the server would be done. This led industry analyst David Ferris, editor of the San Francisco-based newsletter "Ferris E-mail Analyzer," to conclude that Lotus is not very far along in its development process.

Lotus' timing could be critical. Microsoft has indicated that EMS will ship in the first half of 1994. While Microsoft's plans may not affect some current CC:Mail customers, they could sway users who are just beginning to migrate from mainframe systems or who are beginning to reevaluate their electronic-mail strategies.

GE Capital Fleet Service in Eden Prairie, Minn., is one of those companies. A CC:Mail site for two years with 1,300 users, the car-leasing company will begin in two weeks to reexamine the major E-mail systems, said Terry Sovil, a project manager in office automation.

Lotus also reiterated that it is developing an updated post office, called Sequoia, for traditional CC:Mail. Also, the company said it will develop new client software to work with Sequoia.

For Notes/CC:Mail integration, Lotus will deliver a client/server version of CC:Mail that will use the Notes directory store and LCS for transport. Eventually, this version and Notes will share the same interface, Lotus officials said.

Lotus is also working on a stand-alone forms package for early 1994 delivery that will operate across Notes and CC:Mail and will allow access to information in the Notes database.

What's to come

Near term (expected by year's end, in rough order of delivery):
- Organizer for Macintosh: overhaul Macintosh version of group-scheduling software.
- CC:Mail for Macintosh 2.1: fixes problems such as slow response and lack of spell checking.
- CC:Mail Remote for DOS 3.5: includes wireless support and message previewing.
- CC:Mail for Unix 1.1: client software for Solaris 2.1 and OSF/Motif Windows Managers.
- CC:Mail Link to MHS 2.0: updated gateway to Novell's MHS.
- Automatic Directory Exchange (ADE) 2.0: will synchronize CC:Mail post office directories and allow multiple iterations of the same user name.
- Admin. 3.0: administration tools for ADE includes a free set of administration utilities.

Midterm (three to 12 months out):
- Windows Mobile 2.0: remote version of CC:Mail for Windows multiple location profiles, wireless drivers.
- Organizer Scheduling for DOS: interoperable with Windows and Macintosh versions.
- Organizer connection to IBM Professional Office Systems or OV/VM: partnership between Attachmate Corp. and Lotus to allow searching for free time and exchange of meeting notices across mainframes and LANs.

Long term (12 to 18 months):
- Sequoia Post Office: overhaul update to traditional CC:Mail post office that does not require users to take the server down to reclaim disk space.
- New Sequoia readers and gateways: includes a DOS version of the LCS.
- CC:Mail Post Office Edition clients: offers unified set of features across platforms.
- LCS: multitasking X.400/SMTP-based server that will route mail traffic to CC:Mail or Notes directories and will support non-Lotus mail clients.
- Client/Server CC:Mail: CC:Mail for LCS.

All we want from Lotus is. . . .

Customers of CC:Mail at last week's user group conference differed on what capabilities they want Lotus to deliver first, but enthusiasm for an updated new directory was high.

For example, Joe Klehe, a networking engineer at Syntex, Inc., a pharmaceutical company in Palo Alto, Calif., said directory synchronization among CC:Mail post offices is his top priority.

The current release of Lotus' Automatic Directory Exchange (ADE) sends updates from one post office to another but does not verify that post offices are "in sync." This leads to creeping directory corruption, Klehe said.

The upcoming ADE Version 2.0 appears to address this limitation, but in the meantime, Syntex has created a homegrown synchronization program that does the job.

Other users were more interested in seeing CC:Mail connections to outside systems improved.

Gregory Kandl, chief of the information planning and requirements branch at a large government organization based in Chicago, said he is indifferent to Lotus' messaging server announcement. What he really needs are X.400 and SMTP gateways to exchange mail with outside organizations, he said.

For Terry Sovil, an office automation manager at GE Capital Fleet Service in Eden Prairie, Minn., electronic forms based on Notes or CC:Mail is his top priority. That is because the company is striving to "go paperless" as part of a broader move to client/server computing, he said. —*Lynda Radosevich*

Medical center in tune with Clinton reform

By Joanie M. Wexler
BOSTON

When the Clinton administration's health care reform plan hit the streets last week, at least one medical services provider was already en route to overhauling its patient care delivery system via new information technologies.

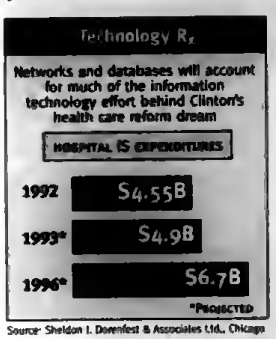
New England Medical Center here is revamping its business, a monumental task that includes redefining its relationship with insurance carriers and instigating a network-centric approach to treating patients.

The goal is to leverage emerging technologies as an incentive for the facility to streamline operations and conserve costs while boosting the quality of care, said Bill Montgomery, vice president and chief information officer.

The center believes it will be "more efficient for us to get information from videoconferencing or digital imaging" while still providing quality care, Montgomery said.

But the multiyear plan stretches beyond the efficiencies associated with automation. The center is banking on the power of networks to allow physicians the freedom to provide what they deem appropriate treatment independent of what they will be reimbursed for.

The idea is to discard the current insurance system of being reimbursed for "doing things to people," and instead contract with an insurer for a certain number of dollars to handle a given patient case in whatever method a physician sees fit, including network-oriented home care. The center would eat the cost if not successful and thus be incented to provide quality care.



Source: Sheldon I. Dorenfest & Associates Ltd., Chicago

New England Medical's agenda, which is in step with an aspect of the Clinton plan that encourages using the information superhighway [CW, Sept. 20] to bring hospitals, doctors, patients and insurers together, depends on new-generation networking technologies such as Integrated Services Digital Network (ISDN), T3 (45M bit/sec.) leased lines and Asynchronous Transfer Mode (ATM).

Trials under way include a joint effort with IBM in which outpatients' family members provide real-time data about patient status through a PC that acts like a remote hospital LAN node. They communicate through the PC over ISDN or dial-up lines via modems.

Interhospital trials with T3 lines and ATM are helping the center assess the benefits of interphysician discussions about treatments.

What the center is doing addresses the key issues medical facilities need to address in order to survive: how to decrease costs and re-engineer delivery systems, said health care information systems consultant Charles Singer, president of Charles J. Singer & Co. in Wakefield, Mass.

A picture is worth a ~~thousand~~ 25,000 lines of code.

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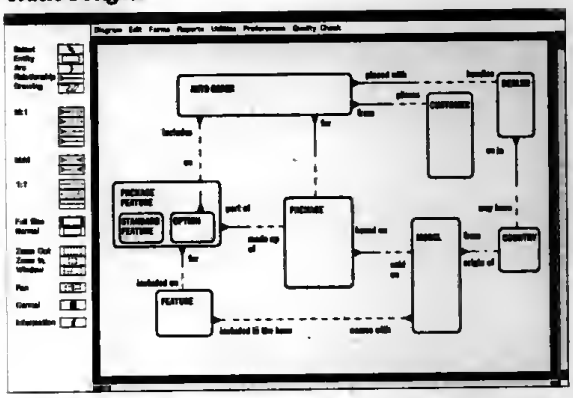

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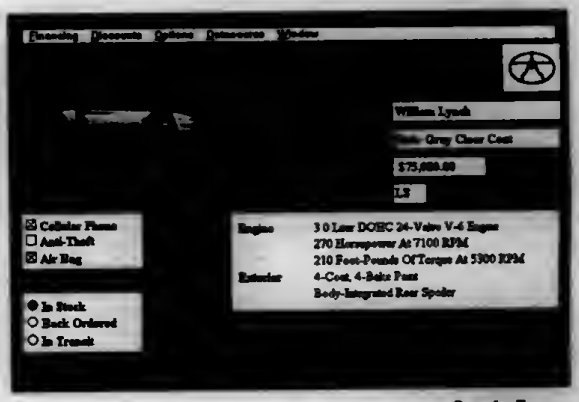

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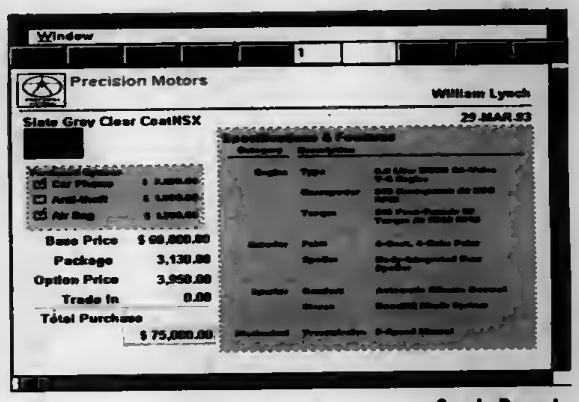

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10 billion bits per square inch?

IBM researchers in San Jose, Calif., have seized on a commonly known phenomenon, giant magnetoresistance, and are finding a way to apply it that could multiply disk drive capacity fiftyfold and supply a boon to low-power mobile computing (see story page 32).

Competitors are shaking their heads in disbelief that any such gains will materialize before the year 2000. "I think talk about giant magnetoresistance is speculation. It's seven to eight years away," says Charles Christ, vice president of Digital Equipment Corp.'s Storage Business unit. But IBM is talking about giant magnetoresistance drives within three years.

I understand skeptics who say IBM is desperate for good news, but they should remember that IBM has been a leader in storage for 26 years. After visiting its Advanced Storage and Retrieval facility, I would say IBM is going to make good on its claims. If it does, drive capacity will not only increase dramatically, but drive sizes will continue to shrink. Giant magnetoresistance encourages further miniaturization.

An IBM breakthrough promises mega storage on small, low-power disk drives.

Charles Babcock

Today's hard drives are based on induction, where a magnetic field representing a bit induces a tiny electrical current as it passes under the drive head. The force of the field depends on the spinning disk's speed, and supplying power to the disk motor is a drain on a battery-powered laptop.

Drive heads based on plain vanilla magnetoresistance, which have been on the market only a short while, function by registering a change in the resistance to electricity in a conductor when it is exposed to a magnetic field. Resistance typically increases 4% to 6% maximum (or 1% in the small scale of a drive head).

It has been known for some time that this effect can be magnified under special circumstances, increasing resistance by 40% to 60%. Generating this kind of giant magnetoresistance in the past has required magnetic fields 1,000 to 2,000 times stronger than those used on a hard disk and temperatures of minus 450 degrees Fahrenheit, not exactly optimum conditions for the desktop.

What IBM engineer Todd Hylton and three associates have done is find a way to create giant magnetoresistance with materials and conditions that mimic those in use today.

Because giant magnetoresistance yields a pronounced effect from a small magnetic field, future drives based on it will allow the bit size to shrink further and the disk spin to slow, reducing power consumption. All forms of hard drives would benefit, but portable computing would be one of the largest beneficiaries.

The IBM team attacked the problem by sandwiching a layer of nonmagnetic silver between two nitrathin layers of nickel/iron. The nickel/iron layers naturally aligned their magnetic poles in opposite directions, similar to the way refrigerator magnets repel each other unless they are brought together at opposite poles.

When the metals were annealed, or heated briefly, at 572 degrees, the silver was found to penetrate the neighboring layers of nickel/iron, reducing the strength of their antiparallel alignment.

When the baked sandwich was then exposed to a magnetic field, the force was sufficient to cause the poles in the nickel/iron to realign in parallel, creating the giant magnetoresistance effect. To their surprise, the IBM engineers had found a way to partially "decouple," in Hylton's words, the strength of the magnetic alignment and allow very small magnetic fields to trigger giant magnetoresistant signals. "A 100M-byte drive may one day be the size of a computer chip," Hylton suggests, and IBM claims it will achieve 10 billion bits (1.25G bytes) to the square inch on drives before the end of the decade.

My guess is Hylton is talking with such confidence because IBM has already taken this technology beyond the laboratory stage.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

Oracle eyes systems management

By Kim S. Nash
REDWOOD SHORES, CALIF

Oracle Corp. database users might have mainframe-caliber systems management tools, such as backup and restore and capacity planning utilities, in hand by mid-1994.

Oracle announced last week that it will give Legent Corp., BMC Software, Inc. and five other mainframe and high-end Unix systems management makers application programming interfaces (API) for the Oracle database (see chart). Those vendors said they intend to use the APIs to build links between their management utilities and Oracle databases.

Oracle users cannot wait.

A lack of powerful, stable utilities for Unix has been one downsizing holdup for companies such as Telephone and Data Systems, said Jim Gillespie, database analyst at the Madison, Wis., utility.

Mainframers "are used to security, administration and monitoring tools that haven't yet appeared in the Unix world. That's part of what keeps us on the mainframe," said Gillespie, who is also head of an IBM MVS special interest group within the International Oracle Users Group.

Other users said they were happy about Oracle's intentions but questioned whether mainframe-style products are appropriate for a Unix setting. "The problem is that most of these mainframe companies still think mainframe," said Sylvia Vargas, head of the Puget Sound Oracle user group. If Legent and others simply port existing tools to other platforms, "that's not solving the problem at all," Vargas said.

Utilities appropriate for centralized computing will overlook sets of problems found in distributed database systems, some users said.

For example, setting up parameters authorizing which users can log on to which systems is simpler in a centralized mainframe configuration than for a network of 10 distributed databases running on various hardware platforms, said Paul Song, chairman of the Northwest Oracle user group.

As it stands now, the Oracle database lacks certain management facilities such as thorough self-monitoring in a client/server setup, according to Brad Howie, senior associate at Cornerstone Computer Associates, Inc., a consulting group specializing in Oracle technology in Vancouver, British Columbia.

Tools at your disposal

Mainframe and high-end Unix software makers plan to build links — via an Oracle API — between big iron systems management tools and Oracle databases for use in client/server setups

SAMPLING OF TOOLS

BMC Software	Systems optimizers, backup and recovery
EcoSystems	Configuration management, capacity planning
Epoch Systems	Backup and recovery, storage management
Legato Systems	Network backup and recovery
Legent	Performance analysis, storage management, network monitoring
Open Vision	Performance analysis
Patrol Software	Capacity planning, backup and recovery

SIM tries to define licensing terms

By Mitch Betts
WASHINGTON, D.C.

The Society for Information Management (SIM) forged ahead last week with its mission to make software contracts more customer-friendly by starting to define such slippery concepts as user-based pricing and enterprise-wide licensing.

At a summit meeting with software vendors here, both sides agreed to draft standard terminology to prevent misunderstandings and then develop detailed licensing guidelines for the industry. Harvey Shrednick, senior vice president for information services at Corning, Inc., said the guidelines may be ready by April 1994.

Corning's Harvey Shrednick: *Guidelines may be ready by April 1994*

The goal is to eliminate what users consider unfair software fees and still allow vendors to make a profit [CW, April 26]. The dialogue for reaching a middle ground began last week, but both sides discovered the need to clarify the terms of the debate.

For example, SIM's April position paper urged vendors to move from machine-based pricing to more flexible schemes, such as pricing based on the number of users on a system. But vendors asked how to count the users.

"What if three people use one terminal on different shifts? Should access by remote [or casual] users mean an additional fee? If one person puts software on their office PC, laptop and home PC, how many users is that?" asked Ellen Ray, assistant general counsel at Dun & Bradstreet Software in Atlanta.

Likewise, Ray said, questions exist about how to define the "enterprise" for enterprisewide licensing. "Does that include international offices? Do updates get distributed to all sites across the globe or just the headquarters?"

During the next six months, SIM's Software Licensing Task Force will try to hammer out an agreement on those details and other issues, said Shrednick, who is SIM's vice president for communications.

Information systems chiefs had their own set of concerns, especially about upgrade fees and transfer fees. "If the user moves the software to a more efficient machine — and the software doesn't have any more features or users — why should you pay $200,000 more?" Shrednick asked.

Rivals press Intel

CONTINUED FROM PAGE 1

require 486 code to be recompiled for top performance. Sources said Cyrix claims that a 66-MHz chip based on the M1 design will run most 486 code 30% to 50% faster than today's 66-MHz Pentium.

Cyrix declined to comment on possible performance numbers.

The double whammy of PowerPC and the M1 means that "things are getting much more interesting" for Intel in the market, said Linley Gwennap, editor in chief of the "Microprocessor Report" in Sebastopol, Calif. But Gwennap said the multiple 486 clone efforts are of more immediate concern to Intel and will have a bigger near-term impact on users.

IBM has already beaten Intel to market with a clock-tripling 486 clone, and analysts said Cyrix and Advanced Micro Devices, Inc. will likely bring similar chips to market in 1994. With competitors keeping pace with Intel's coming DX3 [CW, July 19], Intel may find its current cash cows threatened before Pentium ships in high enough volumes to replace them as profit-generators.

The pressure is on

"Intel is going to start to get squeezed [in the 486 market]. I think 486 prices will be dropping rapidly in 1994, which will be the most significant thing to 90% of the users out there," Gwennap said.

"We expect to see 486 pricing drop due to competition and the new [DX3s]," said Jim McDonnell, marketing manager at Hewlett-Packard Co. in Sunnyvale, Calif. However, he said HP does not expect dramatic price cuts until the second half of 1994. Some analysts suggested that sharp reductions in 486 pricing could lead to systems priced less than $1,000.

Users trying to decide whether to buy 486 workstations now or wait for Pentium pricing to drop may opt for the 486 with the price cuts.

"With the software requirements we see on the horizon, we'll probably need to move beyond the 486, but if prices drop, we can buy the higher-level 486s," said Abraham Chait, a team lead at Pacific Gas & Electric Co. in San Francisco.

Because its competitors appear unlikely to ship chips until the second half of 1994, Intel has time to react, analysts said. The chip maker plans to shift Pentium production to a new process known as 0.6 micron, which will let it bring out higher-performance Pentiums.

Those Pentium parts, code-named P54C, should match the M1's expected performance levels, though this will still mark the first time Intel has not been a generation ahead of the cloners.

Seeking to nip PowerPC in the bud, Intel plans a frontal assault on its target market: Macintosh users. Intel will start advertising in major Macintosh user publications in October to persuade those users to move to Intel platforms.

"They see a chance to get this market in a transition time," said Tom Thornhill, an analyst at Montgomery Securities in San Francisco.

Also in Intel's favor: Several sources said the Cyrix M1 chips will not be pin- and socket-compatible with Intel's chips, which may create design and software compatibility issues.

Bruce Burkhardt, director of strategic marketing at Cyrix, declined to comment on whether it would opt to match Intel's design. "Let me propose that the 486 and the Pentium are not socket-compatible. If Intel doesn't have to be compatible why should anybody else be compatible?"

In the oven

Looking to drive up its volumes, Intel has a multiprocessing surprise coming late in the second quarter of next year, according to OEM hardware sources who asked not to be identified.

Intel is working on chip sets that will allow systems makers to build servers that support more than two processors on the same motherboard, the sources said.

Intel's C5C8 chip set supports only two processors; Intel is discussing ways to implement five and six Pentium processors on a single motherboard.

—Michael Fitzgerald

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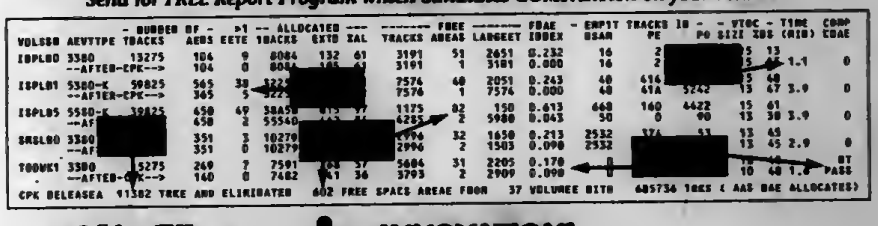

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Windows, OLE

CONTINUED FROM PAGE 1

plications will run on Windows 4.0. But an application written for 4.0 is going to look a lot nicer," noted Don Baarns, president of the Baarns Consulting Group, Inc. in Sylmar, Calif.

Microsoft is expected to deliver tools that will enable developers to convert Windows 3.1 applications to comply with the Windows 4.0 interface. But when the tools will arrive and how robust they will be has developers concerned.

"It's definitely something we're looking at. In the back of our heads, we're asking ourselves, 'Are we wasting our time right now?'" said Michael Abele, vice president of programming services at Varitec Corp. in Birmingham, Mich.

Meanwhile, the few developers that already offer a true drag-and-drop interface with their Windows-based products — something Microsoft will introduce for the first time with Windows 4.0 — will have another interface problem.

This drag-and-drop protocol will be a key technology behind the Windows 4.0 document metaphor. For instance, it will allow users to easily share data across Windows applications that have live links by dragging icons across the screen, as opposed to cutting and pasting data between discrete applications.

One developer dealing with this issue is Keyfile Corp., maker of a work-flow application. It is considering delivery of two different shrink-wrapped versions: one package with Keyfile objects integrated onto the Chicago desktop and another with Keyfile objects on top of Keyfile's existing desktop metaphor, said Kim Shah, vice president of marketing.

Meanwhile, developers continue to wrestle with the concepts Microsoft is presenting in OLE 2.0, which comprises more than 400 interfaces. The problem facing developers is that while there will be a base level implementation of OLE 2.0, each software developer is essentially free to implement any subset of the OLE 2.0 specification they choose.

Consequently, one application may call for a service from another that does not support it. This means users are going to see applications that are better integrated with applications from the same vendor (because they will all support the same interfaces) than with applications from vendors that might not implement the same subset of OLE 2.0 interfaces.

Unix partners
In addition to working on OLE 2.0 for Windows, Microsoft is also joining forces with several Unix systems vendors to port OLE 2.0 to Unix, according to Kraig Brockschmidt, a Microsoft systems engineer.

As a result, OLE 2.0 might actually serve to encourage users to purchase software from a single vendor.

"It's a big problem. Microsoft is going to have to refine the OLE 2.0 standards" to ensure true compatibility across applications, said Daniel Grant, president of Tangent International Computer Consultants, Inc. in New York.

How to be objective

Developers not only face the problem of which interfaces to write to but also the testing of applications they produce.

"The problem is not just writing to all these interfaces but in finding a way to objectively test them. Without that, a lot of this [development] will be pretty useless," said Vadim Yasinovsky, president of Clear Software, Inc.

A lobbying effort is under way among some developers to set up a laboratory where developers can test their applications against a defined set of parameters. Microsoft officials said they will not provide such a facility themselves, but they would back the idea of an independent laboratory.

The lack of a testing and certification program is important because it could stall OLE 2.0's momentum if the OpenDoc alliance — led by IBM and Apple Computer, Inc. — follows through on a promise to set up a similar program and facility late this year or early next year.

Another problem some developers see is that OLE 2.0 cannot support the transfer of OLE files over networks. Microsoft officials have acknowledged that users will not be able to move or delete OLE files over networks until the company ships Cairo sometime in early 1995.

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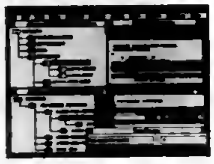

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News Shorts

Too many standards?

Efforts to expand emerging "fast Ethernet" technology to Token Ring networks heated up last week when **IBM and Hewlett-Packard Co.** said they will jointly promote a standard called 100VG-AnyLAN. The idea with the higher-speed versions of existing LANs is to breathe more life into today's LAN investments in advance of higher-bandwidth switching technologies. While IBM and HP said they will submit technology to the IEEE 802.12 committee, formed recently to develop one of two existing versions of fast Ethernet, a similar Ethernet/Token Ring effort from **Proteon, Inc.** announced in August will be taken up by the 802.5 Token Ring standards body.

Microsoft to integrate PCMCIA software

SystemSoft Corp. has signed a deal that lets **Microsoft Corp.** integrate its PCMCIA software into future operating systems. When coupled with this type of software, an operating system gains more reliability and higher performance. The SystemSoft PCMCIA software, called CardSoft, is made up of driver files that automatically load when a PC powers up. Through the agreement, Microsoft hopes to speed user acceptance of PCMCIA and also help move its Plug and Play initiative for Windows.

IBM lab director switches gears

Guy Harrison, formerly head of **IBM**'s Poughkeepsie, N.Y., laboratory where the MVS operating system lives, has moved to the Personal Software Products Group in Austin, Texas, to take charge of development for Workplace OS. That is the code name given to IBM's graphical user interface that will straddle OS/2, DOS and Unix platforms. Harrison made the move to ensure the software will reflect the bulletproof nature of MVS, an IBM spokesman said.

Computerland to sell distribution unit

In a move that some have suggested signals the end of the reseller channel as it has been, **Computerland Corp.** agreed to sell its franchise and distribution division to **Merisel, Inc.** for as much as $110 million. Merisel would gain Computerland's profitable franchise division, its Datago distribution arm and the rights to the Computerland name. Computerland retains its company-owned stores and its service arm, and, with a $60 million up-front cash payment, will end its status as a "thinly capitalized" company.

UPS Canada goes cellular

United Parcel Service, Inc. activated Canada's first nationwide cellular data transfer network last week, designed to provide UPS customers with the ability to receive immediate information on the status of their packages. UPS created the cellular system in a strategic alliance with **Mobility Canada**, a corporation formed by BCE Mobile Communications and Bell Mobility Cellular.

SHORT TAKES Kenneth Thome, vice president of information systems at **General Mills, Inc.** in Minneapolis, was promoted to senior vice president of financial operations, replacing Tom Nelson, who retired. . . . **The Ultimate Corp.** in East Hanover, N.J., has changed its name to **Allerion, Inc.** and will focus on re-engineering consulting and other services. . . . **Motorola, Inc.**'s Paging and Wireless Data Group said it would develop a wireless handheld computer that uses **Microsoft**'s At Work software. . . . **Storage Technology Corp.** said its third-quarter results will be "below expectations" and that it will take a onetime charge of $80 million for restructuring.

News shorts, *page 16*

LAN Server plans hopeful but far off

By Elisabeth Horwitt
AUSTIN, TEXAS

IBM is grooming its OS/2 LAN Server for the global network services environment that corporate users are increasingly demanding and rival network operating system companies are already providing.

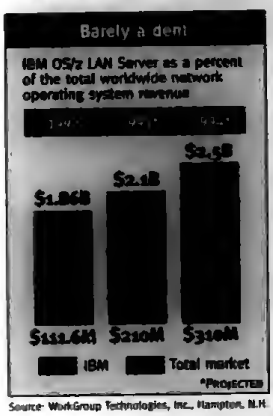
The first major step in this direction will come in a few weeks when IBM unveils LAN NetView, a package providing management of distributed LAN Server systems and various clients via either host or OS/2-based NetView, according to Art Olbert, director of IBM's Personal System Group.

Like Novell, Inc.'s NetWare Management System (NMS), LAN NetView will manage devices via Simple Network Management Protocol, Olbert said.

And like distributed NMS, which Novell is expected to announce Oct. 4, LAN NetView can distribute management of local network systems out to LAN Servers, which can then send key information to LAN NetView, or host NetView, according to Olbert.

The ability to manage distributed LAN Server networks from host NetView is a key capability, users said. The Automobile Club of Southern California, for example, has a "very demanding environment" consisting of LAN Server and diskless PCs, said Steve Nees, supervisor of office systems at the automobile club. "We want to manage that environment remotely from NetView over our existing SNA network. LAN NetView sounds very useful."

Unfortunately, other key enterprise LAN Server services, such as the Open Software Foundation's Distributed Computing Environment-based global naming, directory and security, are still in the pre-Alpha stage, Olbert said.



Source: WorkGroup Technologies, Inc., Hampton, N.H.

Tardy delivery of such services could hurt IBM in the crucial market window of 1994, when Banyan Systems, Inc., Microsoft Corp. and IBM will be competing for those shops that are still defining their client/server strategies, analysts said. Prospects of prying Novell loose from its huge installed base appear slim.

"IBM is trying to gain recognition that it is a player [in the client/server market], that it hasn't disappeared and that it has some advanced products coming out," said Lee Doyle, director of LAN Research at International Data Corp., a research firm in Framingham, Mass.

But future growth for the IBM OS/2-based network operating system will depend on the timely delivery of the above cited services on a par with Novell's and Banyan's offerings, he added.

Indeed, strong enterprisewide naming services and wide-area connectivity were main reasons why Vines and not LAN Server became the primary platform for New York agencies in the past couple of years, said Sam Blumenstyk, director of LAN consulting for the city's Computer and Data Communications Services Agency.

Microsoft

CONTINUED FROM PAGE 1

for the MS-DOS and OS/2 operating systems will be available at no additional charge to all its networking customers, including users of LAN Manager, Windows NT and Advanced Server. Previously, customers had to pay $179 per five-user copy of Microsoft's NT client software.

The price break really makes a difference for large corporate customers, which will be able to save $35,024 for 1,000 users on Advanced Server installations as a result. Companies can now buy an unlimited-user version of NT Advanced Server for an introductory price of $1,495, which will jump to $2,995 in March, Microsoft said.

Novell does not charge for client software; however, its NetWare pricing structure is tiered according to the number of users that a given server can support. A 1,000-user version of NetWare 4.01 is priced at $47,995.

Microsoft's new pricing will certainly weigh in as a factor in how widely the National Immunization Program eventually decides to implement NT Advanced Server, Kahn said. However, it will probably not make a big difference in the program's commitment to NetWare, he added. "We already have the financial investment in Novell."

A more fair cost comparison would be one between Advanced Server and UnixWare, Novell's Unix-based application server, Novell spokesman William Donohoo said. "NT does not compare with NetWare 4.01" because the former lacks key network services such as global directory and authentication, he said. The server edition of UnixWare is priced at $1,299 for an unlimited number of users.

Could reach 10%

If Microsoft's pricing structure is successful, Advanced Server market share could climb to 10% next year out of a total worldwide network operating system market of $1.8 billion, said Bob Flanagan, a senior analyst at WorkGroup Technologies. This year's market totals $1.5 billion, he added.

While Novell is "always looking at its pricing," the vendor has perceived no user unrest about NetWare's current pricing structure, Donohoo said. However, Novell is likely to respond either with price changes or legal action, such as a charge of anticompetitive pricing against Microsoft, if NT Advanced Server starts cutting into its revenue next year, Flanagan said.

NT redirector

Claiming that Novell was taking too long to deliver a jointly developed NetWare redirector for Windows NT, Microsoft has come up with its own redirector.

Novell has for some time offered a prerelease version of the redirector on Internet and CompuServe. However, the release is missing key pieces such as IPX support for Winsockets, DOS and Windows virtual clients on NT and support of the NetWare 4.01 global directory, a spokesman conceded.

Directory and Winsockets support will appear in the general-release version slated for delivery early next year; however, DOS support may come later.

Microsoft's version will provide full NT client support as well as Token Ring support, which Novell's release lacks, a Microsoft spokesman said. Microsoft plans to release a beta version of its redirector within 30 days.

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HP users still stung by order processing, support snafus

Company says remedies on way

By Mark Halper
SAN FRANCISCO

Hewlett-Packard Co. may indeed have replaced Digital Equipment Corp. as the country's second-largest computer vendor, but it has done so despite a couple of lingering internal nemeses.

At a user conference resonant with mea culpas from Chairman Lewis Platt and other HP executives last week, HP conceded that overhauling its archaic order fulfillment system has proved more difficult than expected.

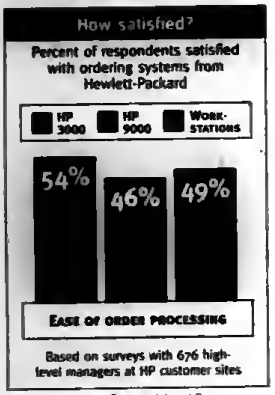
"One of my Top 3 goals is to fix order fulfillment," Platt told an audience at his keynote address at Interex, The International Association of Hewlett-Packard Computer Users meeting.

Revising last year's prognosis of improving the system by this time, Dick Love, vice president of order fulfillment and manufacturing, said, "We're expecting to see acceptable performance within the next few months, industry parity within a year and a leadership position within two to three years."

Furthermore, HP executives acknowledged, the company's sales response effort is lagging. Manuel Diaz, worldwide computer sales and marketing general manager, cautioned that users cannot expect the type of attention they received prior to HP's work force reductions.

That point is already apparent to some HP users. During an open microphone session, James Ouellette, director of management and information systems at Connecticut Attorneys Title Insurance Co. in Rocky Hill, Conn., described his HP sales support as "a nightmare. We went from seven salespeople to not seeing [any] for two years."

Although HP promised at last year's Interex conference to make significant order fulfillment strides by the time of this year's meeting, Platt issued a bleak progress report. "We're just now getting a handle on how hard this is," he said.



Source: Interex 1993 Strategic Interest Survey

And as the challenge daunts them, the issue haunts them. Users have been complaining that HP's creaky order fulfillment system slows down delivery as well as price quotes beyond acceptable levels [CW, March 29].

According to survey results Interex issued last week, users gave order processing low marks (see chart). In contrast, users gave hardware satisfaction ratings ranging from 98% to 100% and software satisfaction ratings of 83% to 93%.

Earlier this year, Platt reassigned Love to devote full-time attention to the problem. "The competition can turn around a quotation faster than we can," Love said. "Our time is days. We'd like to see it in hours or seconds."

Chuck Piercey, Interex executive director, explained that HP runs a mishmash of order fulfillment operations designed to support separate businesses within HP that now sell to mutual customers more than in the past.

One of the keys to the forthcoming system is an electronic quotation and composition configuration program under development called Conquest. Beta versions of Conquest, co-developed with Trilogy Development Group are installed on HP 9000s at about 10 sites worldwide.

Invisible reps

Meanwhile, HP customers are still smarting from sales support cutbacks. Some customers were switched to phone sales, and many have complained that they never see their representatives and that they have trouble reaching them.

This problem has cost HP some customers [CW, April 12]. Lawrence Simonsen, MIS manager at Springville, Utah, valve maker Valtek, Inc., announced at the open mike session that this Interex conference would be his last because his firm is switching to NCR Corp. equipment. Simonsen faulted HP salespeople for failing to meet with Valtek's chief financial officer.

Diaz said the company is working to provide a higher level of sales support but cautioned that because of economic conditions, "it will not be the same level of service as in '91 — no one can do that."

Prepared to change its mind

With an eye toward staving off possible customer defections, Hewlett-Packard Co. last week indicated ways it may want its proprietary IMAGE/3000 database ported to the Unix-based HP 9000.

HP posed the question — one of several in a survey the company issued to users at Interex (see story at left) — just one year after it told customers that such a move would require a large software effort and that the system's [illegible] would be substandard, acknowledged Rich Sorvik, HP's mainframe chief.

Some users [illegible] hostility as it is, in anticipation that users of its MPE-IX-based HP 3000 who migrate to Unix may choose platforms other than the HP 9000 Unix box, which runs HP-UX.

Image/3000, in the form for MPE-IX (see story page 85), and if it were migrated to Unix, could easily load existing database applications onto HP-UX, he would be more inclined to stick with HP rather than find another Unix vendor.

Sorvik claimed that HP does not have a defection problem. [illegible] On report that said 67% [illegible] running that [illegible] have the mind-set [illegible] database, Allbase, [illegible] such as Oracle Corp. [illegible] more popular data- [illegible] said could that's [illegible] workers.

Robert [illegible] Shearson Lehman & Quist, Inc. in [illegible] that Shearson type of sensitivity [illegible] took a low-profile position that would [illegible] on main-[illegible] IBM's DB2 will [illegible] on the HP 9000. The move comes a little over a year after IBM said it would make CICS available on HP 9000s. — *Mark Halper*

Wellfleet

CONTINUED FROM PAGE 1

said Al Candela, vice president of data planning at Chemical Banking Corp. in New York.

Since the bank has about 20,000 IBM terminals, "this means more than a little to us," he said. Today, on the LAN side of the house, Chemical runs a source-route bridged Token Ring internetwork and has "tremendous problems with broadcast storms," an infamous issue with the technology.

Candela said he anticipates that after some heavy prototyping, Data Link Switching could nsurp the bank's source-route bridging infrastructure.

Meanwhile, the heightened status of the VME-based boxes is "a good thing: capital G, capital T," said John Scoggin, supervisor of network operations at Delmarva Power & Light Co. in Newark, N.J., which uses the older line.

"In Release 7.6, we'll finally get all the goodies that the Backbone Node people have always taken for granted," he said.

Scoggin is particularly motivated by the software fault tolerance achieved by Wellfleet's design of distributing protocol stacks, management and other processes out to individual LAN modules rather than centralizing the function in a potential single point of failure.

One reason is that Delmarva has just completed its LAN internetwork. "All our customer service is now totally dependent on our routed backbone," he said.

Other Wellfleet Release 7.6 highlights include the following:

- The ability to manage Wellfleet routers from IBM's LAN Network Manager and thus from NetView. Candela said this allows his SNA-oriented information systems staff a view of the router network.
- Incorporation of Madge Networks, Inc.'s Fastmac Plus technology, which Wellfleet said will double its Token Ring internetworking performance.
- Schemes that reduce broadcasts in source-route bridging networks.
- Backward porting of such Backbone Node features as the standard Point-to-Point Protocol for router interoperability across wide-area networks and support of Banyan Systems, Inc.'s Vines IP traffic.

Vines support is important to Scoggin, who currently encapsulates Vines in Internet Protocol (IP) packets across the wide area via a function in his Banyan servers that "eats a lot of horsepower. We'll eliminate that."

First to market

Wellfleet's Release 7.6 represents the first box on the market to support Data Link Switching, the emerging industry-standard scheme for merging SNA traffic onto distributed internetworks.

Also, having one set of source code for all platforms means that customers using both Wellfleet product lines will gain interoperability between both environments with these and all other functions.

- An Asynchronous Transfer Mode (ATM) Data Exchange Interface, which defines how local ATM cells are placed on a wide-area leased line.
- Enhanced traffic prioritization and more flexible dynamic load-sharing schemes that allow bandwidth to expand and contract upon user request to accommodate different types of traffic.
- Support for AppleTalk protocols over frame relay and Switched Multimegabit Data Service WANs.

The new release is "so comprehensive, my first reaction is, 'why didn't you call it Release 8.0?'" said Michael Howard, president of Infonetics Research, Inc., a consultancy in San Jose, Calif. There is such a bulk of improvements, he said, Wellfleet "might have missed a chance here, positioning-wise."

SYBASE

Mark Page knows the situation well. Vice President of Connectivity Products at Sybase, he's helped a long list of customers develop integrated solutions to one of the most significant problems in client/server computing. He shares that experience in a taped conversation ***"Making Connections In Client/Server Computing."*** **For your copy, call 1-800-SYBASE-1.**

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Novell to move UnixWare to fore

By Elisabeth Horwitt
NEW YORK

■ Novell, Inc. detailed plans last week for moving UnixWare onto the front burner of users' client/server strategies, saying it will provide tighter integration with NetWare global services. The company also promised to provide OEMs with UnixWare in binary and source code form starting in the fourth quarter.

In addition, Novell announced a UnixWare-compatible certification program and expanded its Certified NetWare Engineer program to include UnixWare.

The idea is to make UnixWare and NetWare into an integrated "matched pair." NetWare will be the network services platform and will support applications in smaller sites that do not want UnixWare. Meanwhile, UnixWare will act as the scalable robust server for mission-critical corporate applications, said Kanwal Rekhi, executive vice president of Novell's Unix Systems Group.

Novell's decision to bundle NetWare services and updates into the UnixWare source code free of charge will be a costly but probably effective way for the company to jump-start its Unix system into the volume-shipped, shrink-wrapped desktop and server markets, said Bob Gill, a director at Gartner Group, Inc., a Stamford, Conn., research firm.

The integration of NetWare and UnixWare in source code form "will speed our time to market and let us concentrate on adding value," a Data General Corp. spokesman said.

The source code will conform with X/Open Co. standards and a common Unix application programming interface (API) that will allow Unix applications to run over multiple Unix variants. A 75-vendor consortium agreed to support the API by mid-1994 [CW, Sept. 6].

In addition, Novell's support of X/Open and its expected future move of turning the UnixWare brand name and interface over to the standards body [CW, Sept. 20] should reassure OEMs, independent software vendors and users alike that the system is a true open standard and not a proprietary Trojan horse that will put them under Novell's control, analysts and vendors said.

Novell Chief Executive Officer and President Raymond Noorda confirmed last week that Novell is working toward this but would not provide a time frame.

Rollout specifics

Through a product rollout slated to start in mid-1994, Novell will provide the following:

- A utility that maps between UnixWare and NetWare directories, enabling users to access both types of servers transparently across the enterprise.
- NetWare Management System services for UnixWare.
- Software licensing administration and centralized software distribution across both platforms.
- Extension of AppWare, Novell's multiclient/server application development environment, to UnixWare clients and eventually to UnixWare servers.
- Integration of the two platforms via Network File System and TCP/IP.

Still missing was a firm Novell commitment to Distributed Computing Environment (DCE), the Open Software Foundation's standard for distributed Unix-based computing.

"DCE is still not in high demand," said Michael DeFazio, a Unix Systems Group vice president. "As it evolves, we'll support it in UnixWare and NetWare, primarily through third-party partners."

Novell's focus for integrating UnixWare and NetWare will not be DCE but TCP/IP and NetWare services, DeFazio said.

Unix trademark switch on hold

By Jean Bozman
NEW YORK

It was a near miss.

Despite high expectations throughout the Unix community that Novell, Inc. would announce its decision to turn over Unix System V Release 4 source code to X/Open Co., the Orem, Utah, networking giant stopped short of doing so at last week's Unix Expo.

Indeed, Robert Davis, vice president of marketing at Novell's Unix Systems Group, alluded to political wrangling as he described the last-minute talks with key Unix players to reach agreement on the trademarking move: "In an effort to move this thing forward, to make it happen by Unix Expo, we ran out of time."

Deal was real

Novell's discussions were for real, vendors affirmed. "They are looking to take the name outside," said Ron Bell, chief technology officer at Data General Corp., one of the System V Release 4 licensees.

In fact, Novell came so close to striking an accord that several Unix vendors said they arrived at Unix Expo with press releases of support in hand and were surprised when the trademarking move did not materialize.

Users were also disappointed because a "branding" of standard Unix could cut application development costs and improve application portability among hardware platforms. But some said they are already satisfied with a wide-ranging Sept. 1 agreement among Unix vendors to support a set of more than 1,100 common application programming interfaces (API) certified by X/Open.

The talks started in July, when Novell acquired Unix System Laboratories, Inc. (USL), which owned System V Release 4. Davis still expects an agreement, but he would not say when it would be reached.

Instead of making the expected announcement, Novell officials used the show to make clear their intention to work with an industry body such as X/Open to handle Unix compatibility and trademarking [CW, Sept. 20] but provided few details.

Fine-tuning first

Davis said the company "absolutely believes that a single interface of Unix is important," while Novell officials hinted that the company would rather provide a "finished" version of Unix, such as Novell's UnixWare, for branding, than hand over only the Unix System V Release 4 source code.

Analysts predicted that vendors such as Sun Microsystems, Inc. or IBM — which supply the Solaris and AIX operating systems, respectively — would probably balk if Novell tries to brand its UnixWare implementation of System V Release 4 as an industry standard.

Sun Chief Executive Officer Scott McNealy said he would endorse a Novell move to brand its Unix interfaces through X/Open. But he asserted Sun's right to make building or buying decisions about finished Unix implementations such as UnixWare.

"Unfortunately, what Noorda did was buy the [USL] brand name because he didn't have a lot of implementation horsepower. I would like to see the USL team create some compelling technology for an open interface and allow us to make a buy decision," McNealy said.

Pros and cons of Unix branding by X/Open

PROS
- Easy for users to find compatible software.
- Boosts interoperability.
- Reduces development costs.
- Promotes vendor compliance with X/Open standards.
- May reduce the number of Unix "flavors."

CONS
- Compliance testing could slow Unix evolution.
- Discourages vendor-specific features.
- Vendors may balk at adopting "standard" Unix code from Novell.
- Limiting proprietary extensions would hurt profitability.
- May overburden X/Open, which already brands XPG4 and Motif.

Source: X/Open Co.

HP offers full Corba implementation, finally

By Melinda-Carol Ballou
NEW YORK

Hewlett-Packard Co. last week unveiled an implementation of the Object Management Group (OMG)'s Common Object Request Broker Architecture (Corba) that uses the Distributed Computing Environment (DCE) from the Open Software Foundation as its transport mechanism.

Corba includes a language for describing application interfaces as well as dynamic and static application programming interfaces for accessing objects across the network. It acts as a kind of object traffic cop, offering directions to enable software existing on a network to communicate with software elsewhere.

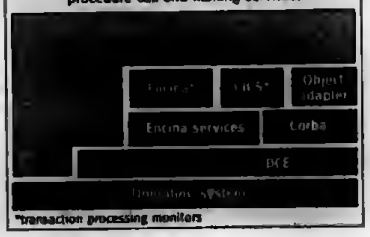
Although HP was one of the first to contribute to the Corba specification, it is one of the last to ship a full implementation of the standard.

HP's ORB Plus includes its Distributed Object Management Facility (DOMF), object services, development and administrative tools and sample applications. HP is now combining DOMF with IBM's Distributed Systems Object Model to allow developers to create applications that are scalable, interoperable and portable across HP and IBM platforms. Both companies will comply with an interoperability standard for Corba that the OMG will establish in the first half of 1994.

HP users said they were enthusiastic about the release of ORB Plus, which is now beginning to ship to users via an early release program and will be generally available with a developer's kit in the first half of 1994.

Object of desire

HP's ORB Plus uses DCE as its transport mechanism. It is integrated with DCE through DCE's remote procedure call and naming services.



*transaction processing monitors

The University of California at Davis (USC) is hoping to use the technology to create network-based multimedia applications, according to Turnando Fuad, a computer-resource manager at USC's Center for Image Processing and Integrated Computing.

Fuad said he is interested in the links to DCE as a way to connect ORB Plus applications with DCE-compliant platforms.

Pricing for the ORB Plus developer's kit will be made available when the product ships.

Reporter's Notebook

The **Common Open Systems Environment** (COSE), an ad hoc vendor group attempting to accelerate commonality among Unix environments, held its first systems management subgroup meeting last week to begin reviewing requirements for Unix systems. It is still unclear whether COSE will adopt systems management interfaces from a slew of vendor packages or support the best-of-breed features within packages supported by the **Open Software Foundation** (OSF), **Unix International** and other leading systems management vendors. Sources said COSE may make an announcement by late November.

In the meantime, **Computer Associates** will submit to COSE APIs from its CA-Unicenter for Unix systems management package by mid-October, according to Alfred H. Novissimo, CA's vice president of research and development. Novissimo and other executives close to COSE said they were unsure when the group planned to decide on the systems management format.

Tivoli Systems in Austin, Texas, last week extended support for its Tivoli Management Environment framework to **IBM**'s RS/6000 and **SunSoft**'s Solaris 2.3 and unwrapped Tivoli 1.6. The upgrades will ship in December. Tivoli 1.6 will support new print management and E-mail management applications.

SunSoft last week introduced Solaris 2.3, its fourth release of Solaris 2.X since the operating system was first announced in June 1992. Solaris 2.3 will reportedly feature better support of Network File System (NFS) networking applications, as well as support for the Sun XIL imaging library for multimedia applications and the Wabi interface for Windows-based software running under the X Window System. Solaris for clients is priced at $795; server versions are priced from $1,995.

Unify announced Unify Vision, a cross-platform, object-oriented graphical tool for creating client/server applications targeting a range of RDBMSs. Its SmartView architecture acts as an intelligent interface to the specific databases and allows developers to build complex applications on Windows-based PCs or Unix workstations.

NCR unveiled 3534 XLA X-Station, which includes NCR Telnet 3270 local terminal emulation software to connect to IBM mainframes. The 3534 succeeds NCR's 3533 X-Station and also features a standard 25-MHz RISC processor upgradable to a 33-MHz turboprocessor. It will ship in the fourth quarter with prices starting at $4,195.

Micro Focus and **Transarc** said they have integrated the former's Cobol wrappers with the latter's Encina on-line transaction processor (OLTP) product. This will let Cobol programmers use Encina to create distributed transaction processing applications for Unix. Micro Focus said it will work with **Sybase** to develop an interface for linking Cobol applications with Sybase's SQL Server. Micro Focus also announced its transaction system for Solaris, an OLTP system that supports CICS and non-CICS applications. In addition, **IBM** will start shipping in December Micro Focus tools for Cobol development on AIX platforms along with IBM's Workbench tools.

In other news, the OSF has released the first "snapshot" of its OSF/1 Release 1.3 source code and said it will submit its Unix System V Release 4-compatible Calvin test suite to the **X/Open Co.** ... **Tandem** replaced **Mips Technologies'** R3000 RISC chips in its Integrity line of fault-tolerant Unix computers with R4000 RISC processors. **Tandem** also agreed to resell **Silicon Graphics** Unix computers. ... **Sun** officially announced its SPARCcluster 1 NFS file server, which is a cluster of up to four SPARCserver 10 systems [CW, Sept. 13]. ... **Sapiens International** announced its own Sapiens Vision for HP/UX, an object-oriented tool for rapid development of client/server applications originally developed by **Smartstar**. Sapiens completed its merger with Smartstar in July.

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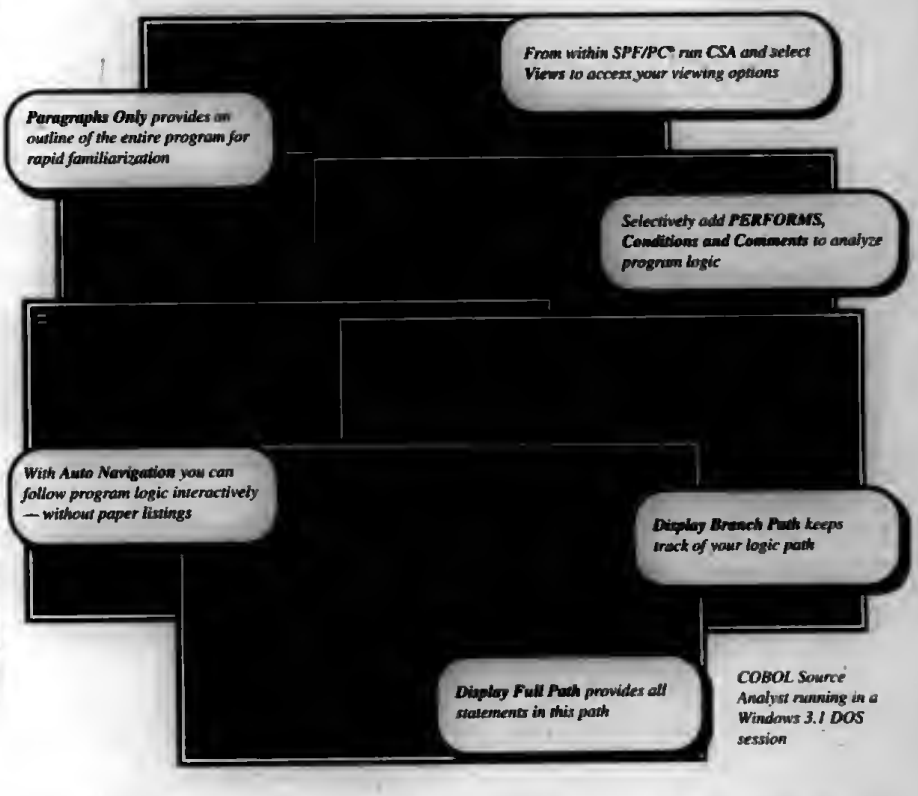

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News Shorts

Massively parallel machine to debut

Next week in Washington, D.C., **Cray Research, Inc.**, will unveil its long-awaited massively parallel processor system, the T3D. Cray declined to provide details about the T3D that is based on Digital Equipment Corp.'s Alpha chip. Analysts said they believe the T3D will eventually scale from tens to at least 1,024 processors. T3D's pricing is expected to start in the single-digit millions; the high-end machine will be priced between $25 million and $30 million.

Health reform eyes electronic Rx

President Clinton last week sketched out his plans for health care reform, which include an emphasis on reducing paperwork and developing data interchange standards for electronic billing [CW, Sept. 20]. A proposed National Health Board would develop standards for electronic billing and for a nationwide information network that would collect data on the quality and cost of health care. However, sources said Clinton advisers were unable to decide on a patient identification numbering scheme [CW, Aug. 9].

WordPerfect outlines Unix, other plans

As expected, **WordPerfect Corp.** last week announced WordPerfect Office for Unix running on **Sun Microsystems, Inc.**'s Solaris 1.0. Other Unix versions are due out in the first quarter. WordPerfect also said it plans to run its namesake word processing package on RS/6000 systems based on the PowerPC architecture. Finally, WordPerfect announced a promotion deal with **Borland International, Inc.** under which WordPerfect will bundle Borland's Quattro Pro 5.0 WorkGroup edition with WordPerfect 6.0 of Windows for $525 through December.

Routers to work with Novell NMS

Stonybrook Services in Bohemia, N.Y., last week announced Router Manager for Wellfleet, software said to manage **Wellfleet Communications, Inc.** routers from **Novell, Inc.**'s NetWare Management System (NMS). The first release will be a Windows-based snap-in application that allows users to view Wellfleet routers as icons and launch Wellfleet's management application from the NMS graphical user interface. The three companies are working on tighter integration with NMS in the future. Router Manager for Wellfleet is shipping now for $1,995.

Borland gives support new twist

Seeking to make itself more attractive to information systems departments, **Borland** this week will unveil its Borland Advantage program. The service and support plan differentiates Borland from its rivals by factoring an average usage estimate into site licenses and also by factoring in the installed base of Borland software. The firm will also launch Borland Assist, a standard program available to users for free. It has two other paid support programs that offer varying levels of service.

SHORT TAKES As expected, the **IBM PC Co.** last week announced new PS/2 Server 85s and 95s. The servers use a design called SynchroStream, which moves data at full bandwidth to each subsystem to circumvent the major throughput bottlenecks.... **Micrografx, Inc.** last week named Gordon M. Tucker president and chief executive officer. Tucker was most recently vice president of strategic development at PepsiCo, Inc.'s **KFC Corp.** subsidiary.... **Adobe Systems, Inc.** last week announced a $11.4 million profit on sales of $78.8 million for its third quarter, ended Aug. 27.... IBM last week announced FlowMark, an OS/2 object-oriented work-flow package.

IBM shows PowerPC systems

By Jean S. Bozman
NEW YORK

IBM has used its PowerPC and Power2 RISC chips in a sweeping renewal of its nearly 4-year-old RS/6000 line of Unix workstations and servers announced last week.

The unveiling of three desktop workstations and a server based on the IBM/Motorola, Inc. PowerPC 601 chip at Unix Expo marked the beginning of IBM's use of that high-performance technology (see chart).

The three high-end servers based on IBM's Power2 chip reportedly provide more than twice the performance of the first generation of Power RISC chips.

IBM also announced an X Window System terminal, a new version of the AIX 3.2 operating system and availability of the high-end SP1 Powerparallel Unix processor, announced in February.

AIX 3.2.5 supports the Visual System Manager distributed systems management tool and a new X.500-compatible global directory. It includes C, C++, Fortran and Cobol tool kits for building Unix applications.

More aggressive?

Despite all the upgrades, some users said IBM is still not pushing open systems aggressively. "But I expect that to change," said David Trevino, computer technology director at the Instituto Tecnologico de Monterrey in Monterrey, Mexico, "because the solutions are more competitive, and you can get better value for your money."

Industry analysts said IBM's PowerPC-based systems will put Intel Corp. on notice that IBM intends to make a comeback in the high-volume PC and workstation markets. IBM officials said the 601-based systems run almost twice as fast as Intel's 66-MHz 1486 PCs and have about the same performance as Pentium-based systems.

IBM's Power Personal Systems division will come out with low-cost PC implementations of the PowerPC chip in the first half of 1994, said Bill Filip, president of IBM's Advanced Workstations and Systems division in Somers, N.Y; this should apply further pressure to Intel-based systems. Workplace OS, the first operating system written to take full advantage of the PowerPC, is due out in the first half of 1994.

The RS/6000 systems' broad power range is intended to address a wide variety of applications, said Tom Jarosh, director of advanced workstations at IBM's Advanced Workstations and Systems division. Low-end PowerPC models may take the place of inexpensive PCs or terminals, he said, while midrange and high-end models will be departmental and corporate file servers.

But a modular version of the AIX operating system called Scalable AIX, which would, for example, cut system overhead in half for AIX Lite laptops [CW, Aug. 30], may not be added until 1994, he said.

Even so, some IBM RS/6000 users said they are waiting for low-end and laptop PowerPC/AIX models to add mobility to the line of desktop and deskside machines.

"We plan to put maps on laptops with a [geographic information system] for people who work out in the field," said Martin Bartel, a senior engineer at Northeast Utilities, a group of five New England utility firms. The Berlin, Conn., site where Bartel works has nine RS/6000s, he said.

However, Tadpole Technology, Inc. in Austin, Texas, which built the AIX laptop around a PowerPC 601 chip for IBM, demonstrated a working model complete with a rubber mouse used in IBM's ThinkPad portable.

The portable system, scheduled to ship in the first half of 1994 and priced close to $10,000, was running a 50-MHz version of the 601 chip under AIX 3.2.5. It had 16M bytes of RAM expandable to 64M bytes, a 210M-byte hard drive and VGA color display using thin film transistor technology. The system also supports PCMCIA cards.

Senior editor Ed Scannell contributed to this report.

Chip off the old block

SAMPLING OF IBM RS/6000S BASED ON THE POWERPC CHIP

[illegible]	Processor	Memory	Storage	Price	Ships
Powerstation 25T	PowerPC 66 MHz	16M bytes	540M bytes	$9,395	10/15/93
[illegible]	PowerPC 66 MHz	16M bytes	2G bytes	$5,445	10/15/93
Servers					
[illegible]	Power2 55 MHz	64M bytes	2G bytes	$64,450	10/22/93

Lotus unveils Unix for Solaris 1.0

By Michael Vizard
NEW YORK

■ Lotus Development Corp. teased Unix Expo show-goers last week with a glimpse of its Unix implementation for Notes when it officially introduced a forthcoming Notes for Solaris 1.0 system from Sun Microsystems, Inc.

Due in the fourth quarter, the Notes implementation for Sun systems is aimed at integrating Sun's installed base with the Notes environment. Lotus will not catch up to Solaris 2.0 until it ships a compatible version of Notes next year.

Lotus' schedule for other Unix implementations, which are targeted at systems from The Santa Cruz Operation, Hewlett-Packard Co. and IBM, has slipped into the first quarter of 1994.

"I'm not surprised. Lotus is notorious with its delivery timetables. I take them all with a grain of salt," said Norman Weizer, president of Weizer Associates, a consultancy in Lexington, Mass. Lotus has been talking publicly about a Unix implementation of Notes for about 18 months.

The arrival of Notes will be welcome news for sites that use Unix as their primary platform. "Right now, a lot of people have OS/2 systems that are used to just run Notes," said Antonio Parham, a Lotus product manager. "They'd like to put all their applications on the same server."

According to Parham, Notes on a SPARC platform will give users access to a RISC platform that supports more physical memory and better I/O performance to run Notes. However, Solaris 1.0 does not support symmetric multiprocessing, which would allow Notes sites to begin consolidating servers by running multiple Notes databases on the same system.

Symmetric multiprocessing will be supported on IBM's AIX, HP's HP/UX, Solaris 2.0 and Microsoft Corp.'s Windows NT platforms in 1994, according to George Gilbert, a Lotus marketing manager.

Meanwhile, Lotus said it plans to launch Notes as a NetWare Loadable Module at Networld Dallas '93 next week.

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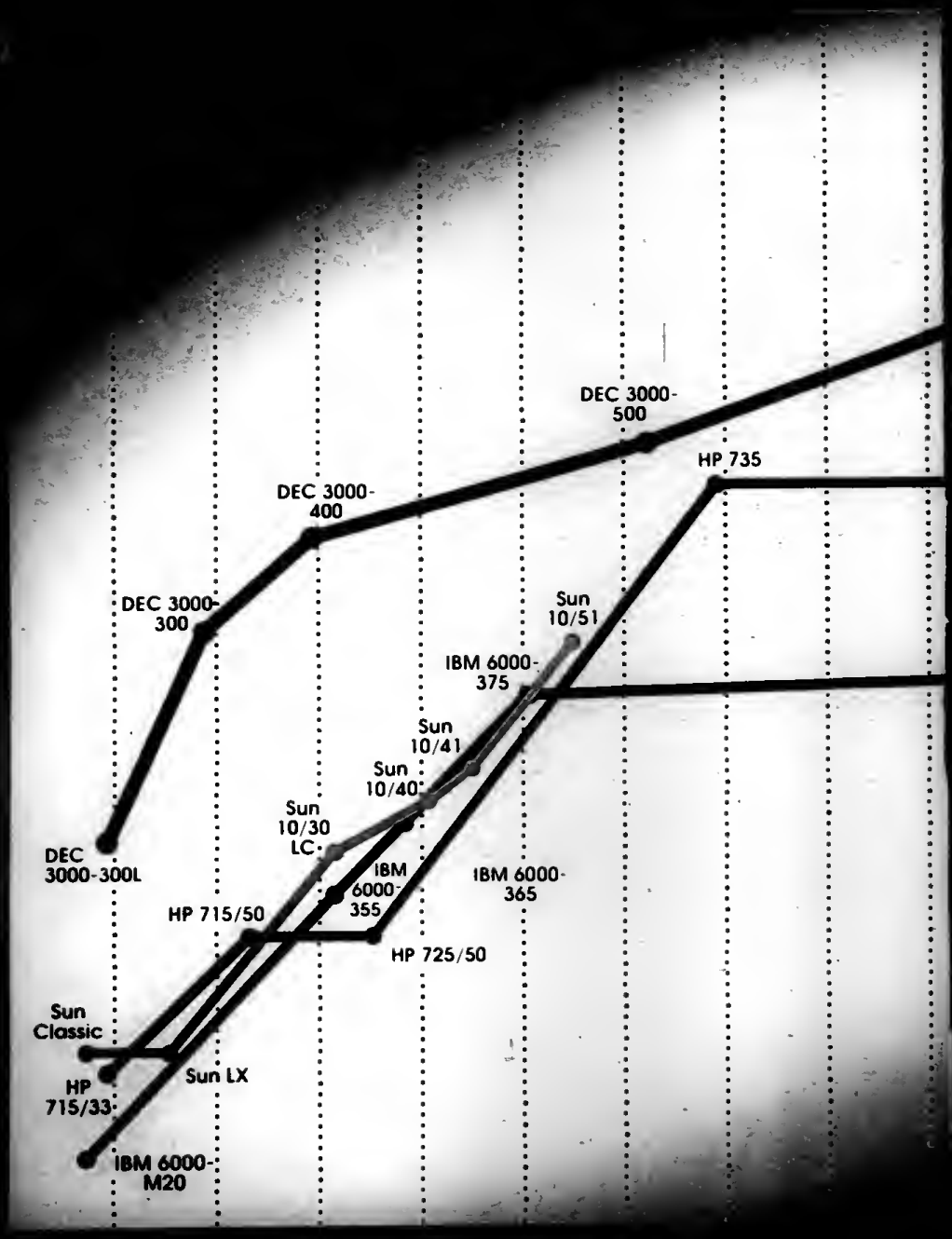

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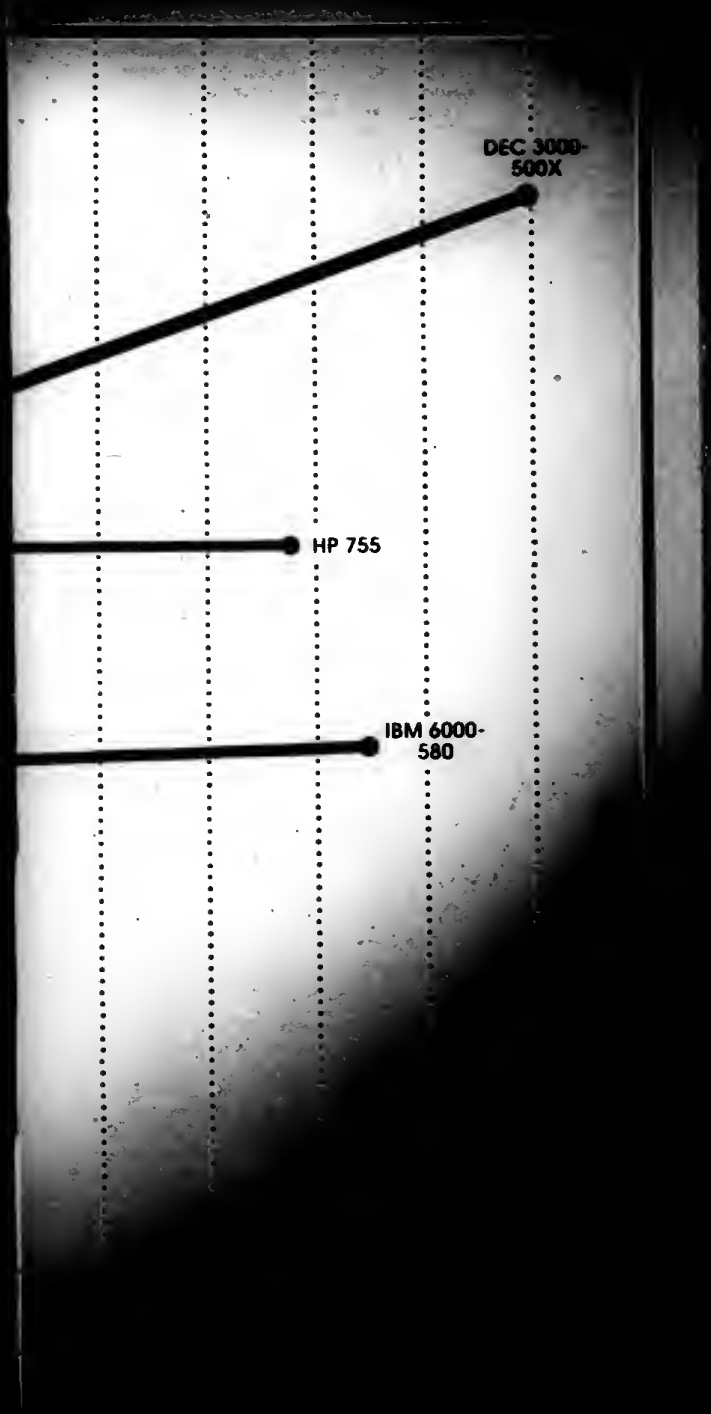

digital

MasterCard, Europay team up on network

By Thomas Hoffman
NEW YORK

MasterCard International, Inc. and Europay international S.A. have joined forces to develop a single, Unix-based global transaction processing network for their 24,000-member financial firms.

When the $90 million project is completed by late 1995, the network is expected to operate up to 10 times faster and more reliably than the IBM Series/1 minicomputer-based networks the payment services providers currently use.

MasterCard executives said the project, which will replace 350 Series/1s with Intel Corp. I486-based Unix servers, will also eliminate European gateways and Series/1 maintenance on both sides of the network. This is expected to reduce information technology overhead for both partners, including an estimated $100 million in cost savings for MasterCard during the next seven years.

The network is expected to deliver all payment services products for both MasterCard and Europay, which together process more than 3.7 billion transactions per year for more than 10.8 million merchants. MasterCard is shelling out $65 million for the project, while Europay is contributing $25 million.

"A move to leading-edge technology, such as the one MasterCard is implementing, will have a positive effect on card issuers," said Lou Iannaccone, a vice president of systems at The Chase Manhattan Bank NA's Direct Response Division, a MasterCard member.

The network, called Programme Global, will be built by combining MasterCard's Project Omni with Europay's Columbus project, according to Philip P. Verdi, executive vice president of electronic services at MasterCard. Both Project Omni, which started in 1990, and the Columbus project were launched to provide process innovations targeted for their respective payment services businesses, including equipment enhancements and state-of-the-art fraud-detection systems.

MasterCard's Philip P. Verdi: *Reformatting of data will no longer be necessary*

According to Verdi, there will be no changes made to MasterCard's global peer-to-peer packet-switching network, called BankNet, which includes fiber-optic connections through Bolt Beranek and Newman, Inc. switching nodes in 14 locations around the world.

More flexibility

"We're going to satellite processing in many parts of the world where terrestrial lines aren't very good, such as the Middle East, Africa and parts of South America. So if you lay that on top of applications we're redoing for authorization for settlement and clearing processes, the Unix environment gives us a lot more flexibility in moving things around [vs. the Series/1]," Verdi said.

For example, when MasterCard's European partners needed to transmit credit-card transactions to a cluster of IBM, Amdahl Corp. and Hitachi Data Systems Corp. mainframes at MasterCard's St. Louis data center via Series/1-to-Series/1 connections, the data would have had to be reformatted from European communications standards to conform with U.S. networking standards. Because Unix standards have virtually become universal, reformatting of data will no longer be necessary, Verdi said.

The X86-based Unix servers will likely be more cost-effective for MasterCard. For example, Verdi said MasterCard member firms that use 10 to 12 Series/1 front-end processors will be able to replace those with two intel-based servers once installations begin early next year.

MasterCard and Europay are now evaluating numerous Unix vendors, though Verdi said his company is leaning toward a mix of IBM PS/2 and NCR Corp. System 3000 servers.

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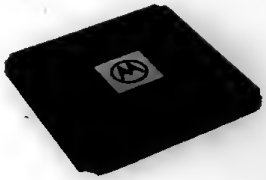

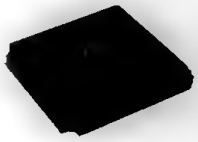

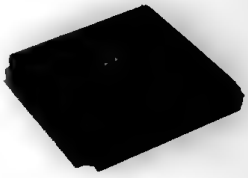

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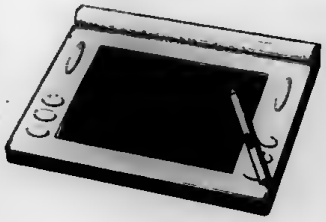

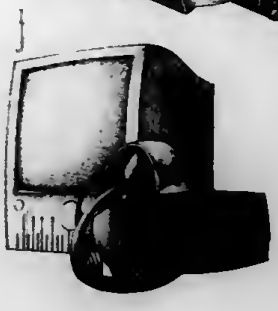

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Legent, HP to link host, Unix worlds

By Gary H. Anthes

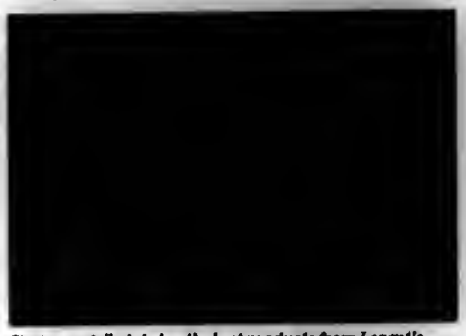
Legent Corp. and Hewlett-Packard Co. last week allied in an effort to produce an integrated suite of tools spanning mainframe and Unix client/server environments for performance and resource management.

Much like another alliance announced last week between Sun Microsystems, Inc. and Amdahl Corp. (see story below), the partnership seeks to address users' concerns about merging legacy systems with newer open or distributed platforms. IBM, meanwhile, is also addressing this issue but will go it alone.

HP and Legent said, and users agreed, that the integrated product suite will make it easier to manage large, diverse distributed computing environments. "Customers are demanding interoperable solutions, and they are demanding that systems management tools span the enterprise," said Phil Carrai, product marketing vice president at Legent.

The companies said they will take "best-of-breed" products from Legent's mainframe tool box and HP's distributed systems management offerings and knit them into a spectrum of capabilities that will allow users to transparently manage system resources across dissimilar operating systems using just one workstation.

The plan extends a concept already embodied in Legent's Paramount, a product for downloading to a PC and displaying and analyzing the output of multiple mainframe performance monitors [CW, May 31]. It also moves Legent into the world of client/server.



Strategy entails *joining the best products from Legent's mainframe tools and HP's systems management offerings*

Just what they want

That is just what Legent and HP customer Mead Data Central, Inc. in Dayton, Ohio, is looking for. Mead, which provides the Nexis and Lexis information services, is moving its in-house applications from MVS mainframes to Unix-based client/server environments. Mead is likely to move its financial/administrative applications and Nexis and Lexis to a combination of HP, NCR Corp. and Sun Microsystems, Inc. Unix platforms, said Daniel Hursh, staff systems engineer.

Hursh said if Legent and HP had not made this move, Mead would have had to build its own bridges between the product lines. "This really brings together two of our key vendors for systems management," he said. "This is exactly what we were waiting for them to say."

Legent will begin selling HP's Unix-based performance and resource management products early next year. In the second half of the year, it will introduce integrated MVS/Unix applications under HP OpenView using Legent's Paramount architecture for performance, capacity and information systems financial management and reporting on Windows and the Open Software Foundation's Motif platforms.

The performance suite will include Legent's MVS, LAN, database and SNA performance products and HP's PerfView, as well as other Unix performance products such as HP GlancePlus. The capacity and financial applications will combine the companies' MVS and Unix offerings, including Legent's MICS and HP's Performance Collection Software products.

The resulting applications will integrate into HP's OpenView network management system and move later to IBM's NetView/6000 and possibly to Sun's NetManager.

Help on the way

Legent offered these scenarios for how its integrated products could help users:

- A Unix server takes data from DB2 on an MVS mainframe and passes it to client workstations. A performance problem in DB2 is detected by Legent's Insight for DB2 performance monitor, which sends an alert to Legent's Paramount. Paramount passes the information on to HP's PerfView performance monitor, which notifies users.
- A company wants to downsize an application from a mainframe to client/server and to look at questions of capacity, performance and user cost across the network. Without integrated management tools, each piece would be examined separately.
- An IS manager wants to look at enterprise-wide systems performance across all operating systems. With the new Legent/HP offerings, the manager will be able to write one query to transparently access data distributed across the enterprise.

Future deliveries from Legent/HP alliance

December 1993: Interfaces will be demonstrated between Legent's MICS products for capacity planning and accounting and HP's Performance Collection Software.

First quarter 1994: Legent will begin selling HP's Unix-based performance and resource management products.

First half of 1994: Legent will introduce a MICS/Unix data integration application that will let users integrate HP Performance Collection Software Unix metrics data through Legent's MICS historical repository.

Second half of 1994: Legent will unveil under the mainframe-based Paramount umbrella MVS/Unix performance, capacity, accounting and reporting applications on OSF/Motif and Windows platforms.

First half of 1995: The Paramount suite of tools will debut on Unix platforms.

Sun, Amdahl team on open systems boxes

By Jean S. Bozman
NEW YORK

Sun Microsystems, Inc. and Amdahl Corp. used Unix Expo last week to announce plans to jointly sell Sun's Unix servers and infuse Amdahl's commercial information systems expertise into Sun's Solaris operating system.

The two are teaming up to counter IBM's broad reach in Unix systems and legacy mainframe applications.

The alliance will also address the need to tie large data centers with proprietary mainframes into growing open systems networks, as will moves by IBM and the partnership between Legent Corp. and Hewlett-Packard Co. (see story above).

Sun expects to gain from Amdahl's expertise in managing heterogeneous systems, including IBM MVS systems and Unix mainframes, analysts said. Amdahl will continue to sell its UTS mainframes.

How it breaks down

HARDWARE
Sun and Amdahl: Both sell Sun SPARCserver 1000 and SPARCcenter 2000 Unix servers.
IBM: Sells RS/6000s and PowerPC-based Unix machines.

SOFTWARE
Sun and Amdahl: Work to enhance Sun's Solaris operating system with the reliability and performance features of UTS mainframe Unix variant.
IBM: Uses standard AIX 3.2 operating system; plans to ship scalable AIX in 1994.

SERVICE
Sun and Amdahl: Will spell each other on service and support.
IBM: Provides its own support and service.

INTEGRATION OF LEGACY SYSTEMS
Amdahl: UTS runs on large IBM-compatible mainframes. Huron will support re-engineering of MVS mainframe applications for use on open systems; it already runs on Sun workstations.
IBM: Tool kits for developers help downsize Cobol and Fortran applications on IBM hosts. New C++ tool kits help to build new open systems applications.

Real interoperability, rather than promises of such, is what users are looking for, according to one New York programmer who works at a mixed-vendor shop that includes HP and Sun machines. "If there were true interoperability, you could flip machines in and out and not worry too much about the software. It's like cars: If someone comes out with more horsepower, you can buy that one."

Huron to the rescue

Another issue is the need for industrial-strength Unix applications. Sun users will be able to use Amdahl's Huron environment, now sold by Amdahl and its Antares venture with Electronic Data Systems Corp., to re-engineer legacy applications for use on Unix servers.

Amdahl Chief Executive Officer Joseph Zemke said Huron has already been ported to Sun's SPARC workstations. IBM, meanwhile, said last week it is providing new tool kits for C, C++, Fortran and Cobol so users can rewrite mainframe applications for RS/6000s.

Users who may have held off on open systems and re-engineering of open systems may like the Sun/Amdahl alliance, analysts said. "I think that what Amdahl represents to Sun is a large-scale commercial Unix platform," said Judith Hurwitz, a development tools consultant in Newton, Mass.

"It's a venture that gives Sun a method to get out of the technical workstation 'box' the industry has made for them," said Donald Haback, executive vice president at D. H. Brown Associates, Inc. in Port Chester, N.Y. "By adding Amdahl's strengths to Solaris, you give the Solaris operating system more commercial viability."

Analysts speculated that Sun and Amdahl may have been motivated to cooperate because Amdahl plans to build future systems around Sun-designed SPARC RISC processors. Both firms use chips made by Fujitsu Ltd.

Sun and Fujitsu have also had a long-standing partnership. Earlier this year, Sun, Fujitsu and ICL agreed to standardize on compatible Unix versions.

The Sun/Amdahl alliance is open-ended, beginning with the cross-selling of Sun's SPARCserver 1000 and SPARCcenter 2000 and the development of Solaris software with enhanced reliability and performance.

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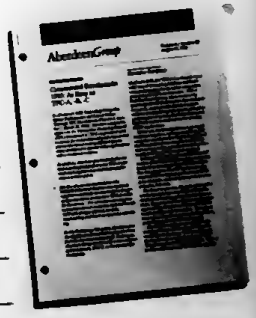

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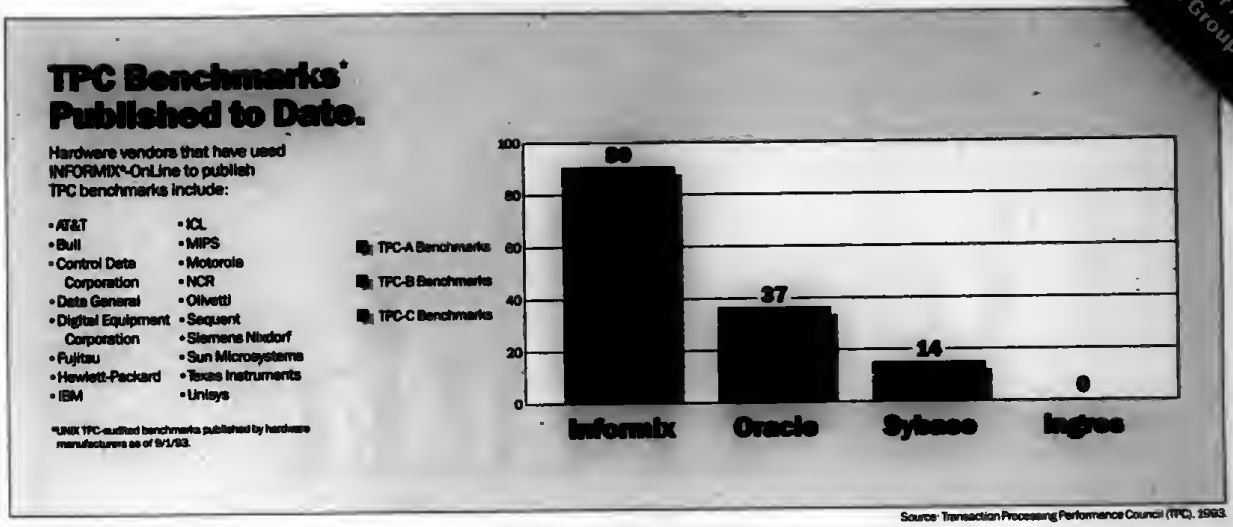

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The truth about

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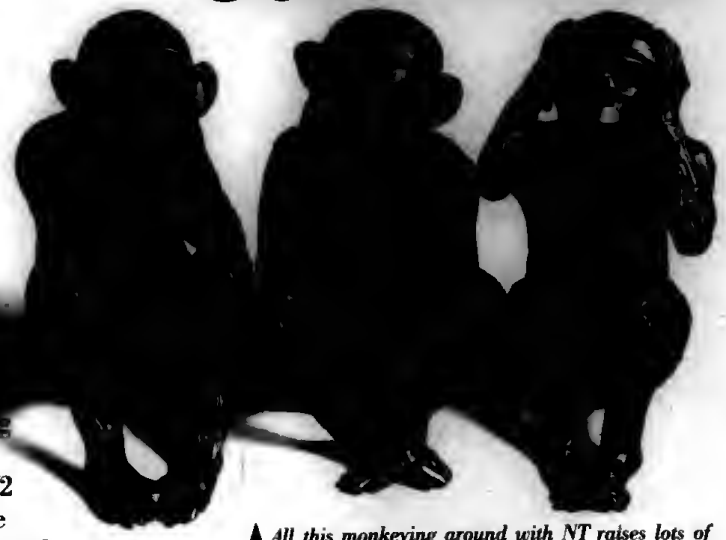

▲ *All this monkeying around with NT raises lots of questions. OS/2 has the answers.*

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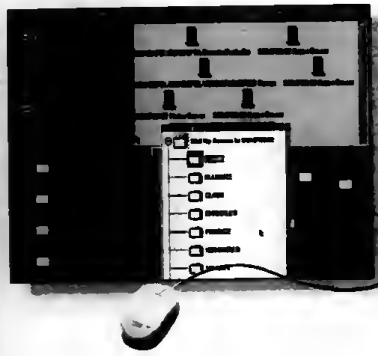

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Digital outsources IS control to itself

By Craig Stedman
HAYNASB, MASS.

Digital Equipment Corp.'s professional services organization is now running the company's data processing operations as a prelude to trying to increase Digital's relatively small presence in the outsourcing market.

Digital plans to focus mainly on network outsourcing, an area in which analysts said the company has a good reputation. However, they added that it has not yet shed its image as a product vendor first and foremost. Meanwhile, some existing Digital outsourcing customers were critical of the company's bureaucracy.

Data center reduction

Internally, the number of Digital's data centers will be reduced sharply following the shift of data processing responsibility from the finance department to Digital Consulting, said Gresham Brebach Jr., vice president of that business unit. He said he expects to cut the roster of about 200 data centers by two-thirds or more.

However, Brebach said the main reason control of the information systems group changed hands was to buy the consulting unit some fast credibility as an outsourcer while also giving it direct control of the IS facilities and workers it uses on outsourcing contracts.

Previously, analysts noted, Digital Consulting had to negotiate individual subcontractor deals with Digital's local IS managers to get space for outsourcing work. It was a time-consuming process, and the cost of facilities, power and personnel varied.

Brebach acknowledged that previous outsourcing contracts had been handled largely on a local basis. "We want to manage that more centrally now," he said.

Paul Johnston, an analyst at International Data Corp. (IDC) in Framingham, Mass., said Digital Consulting is "behind the curve in running [data processing]," compared with other outsourcing vendors, and was held back as a result. "They need to be able to show that they have the infrastructure in place to manage these contracts," Johnston said.

The lack of data processing control also created a perception problem with potential outsourcing customers, Brebach noted. "The first question you get is, 'Do you run your own data processing?' And if the answer is no, you don't get very far."

Following leaders

Digital's outsourcing sales remain small compared with market leaders such as Electronic Data Systems Corp., IBM and Computer Sciences Corp. (see chart).

"They are a factor in their installed base, but when you look at competitive situations, Digital is not up there competing with the Big 3," said Julie Schwartz, a Dataquest, Inc. analyst based in Framingham, Mass.

"Most companies don't even know we're in that business," conceded Brebach, who joined Digital last April after leaving McKinsey & Co.

However, Brebach said he wants Digital Consulting to become more of a factor in outsourcing by mid-1994, still focusing on network outsourcing rather than the traditional glass house data centers.

Rita Terdiman, an analyst at Gartner Group, Inc., a consulting firm based in Stamford, Conn., said Digital earns good marks as a network services provider, despite not having pushed outsourcing "as much as they could have." Terdiman and other analysts noted, however, that Digital has yet to shed its product vendor image. "Their biggest hurdle is that users still view them as a technology company, not a services company," said Mike Melenovsky, an analyst at IDC.

Digital is "good at making hardware and running a data center, and it has lived up to that," said Rod Sikes, vice president of information technology at AMC Entertainment, Inc., a movie theater chain based in Kansas City, Mo., that outsourced its VAX data center and network to Digital last October.

Bureaucracy blues

However, Sikes said he does "get frustrated with their bureaucracy." Digital responds slowly when AMC tries to buy PCs and other products for the operations it still runs internally, and it has not been made clear whether he should deal with the outsourcing unit or with Digital's local sales office for such purchases. "I just try to play both ends and see if I get an answer."

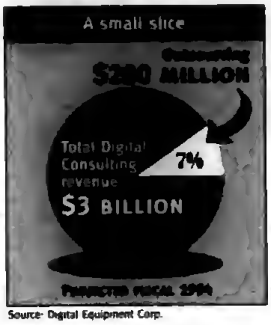
Santo Crisafulli, director of global operations at Foreign Exchange Transaction Systems, Inc., a Citicorp subsidiary in Long Island City, N.Y., has had an outsourcing contract with Digital since 1989. He agreed things "don't always run as smoothly as they should" because of bureaucracy.

Crisafulli said he had no complaints about the quality of Digital's outsourcing work, however, and said the bureaucratic problems have not been beyond expectations. "I'd like to say everything has been perfect, but that would be a lie," he said. "But the bumps haven't been too big, and we've been able in short order to manage through them."

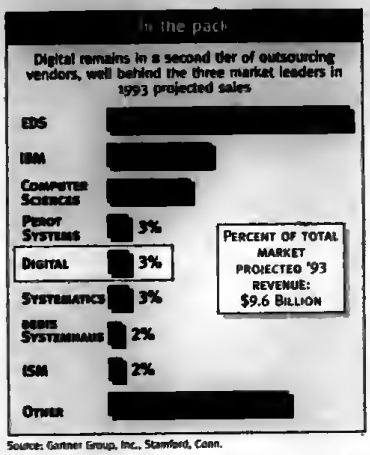
Digital Consulting's Gresham Brebach Jr.: *Unit wants to gain fast credibility as an outsourcer*

Cutting the fat

Gresham Brebach Jr., vice president of Digital Consulting, said Digital has "overly decentralized data processing" and needs to reduce the number of its data centers to cut costs. Brebach, who is now in charge of the company's information systems, declined to comment on how much money he hopes to save in the consolidation process. He noted that Digital's internal IS head count — including the number of workers devoted to outsourcing — will be reduced by an undetermined amount as Digital Consulting takes "the fat out of the current system." The shedding of data centers will take "several years" to complete, he added.



Source: Digital Equipment Corp.



Source: Gartner Group, Inc., Stamford, Conn.

Help wanted

Digital has taken its search for a chief information officer inside the company after failing to entice prospects from outside, following its transfer of data processing responsibilities to the Digital Consulting unit.

"It's not that there aren't good people out there," said Gresham Brebach Jr., vice president of Digital Consulting. "It's just that some people want to control the whole nine yards, and they're not going to be able to do that here because we're running the data centers."

The CIO's main role at Digital will be to manage the development of the company's applications, Brebach said. Some outsiders viewed that as "a step down" from their current duties, he added.

Another stinging point: The CIO will report to William Hunt, Digital's chief financial officer, because financial applications are "obviously an integral part" of the position, Brebach said. He acknowledged that a CIO would typically report to a company's president or chief executive officer, "but in this situation, because of the nature of the job, [working for the CFO] is the way it should be."

Digital recently offered the job to an employee in Europe, Brebach said, but he declined to identify the individual. The firm previously had separate CIOs responsible for Europe, Asia and the U.S., but now wants the new CIO to centralize global application development.

—*Craig Stedman*

Same idea, different company

Digital's hand off of data processing responsibilities to its professional services organization mirrors a similar move last year by IBM, which has been shifting control of data center operations to its Integrated Systems Solutions Corp. (ISSC) outsourcing subsidiary.

Data centers that support IBM's marketing and sales and manufacturing and distribution operations are all being put under the control of ISSC [CW, March 15].

IBM has also been consolidating its data centers in conjunction with the internal outsourcing move.

Controlling internal data processing has virtually become a requirement for outsourcers, said J. P. Richard, an analyst at Input, a Vienna, Va., market research firm. "Most of the substantial vendors run their parents' shops," including market leader EDS with General Motors Corp., according to Richard.

A holdout is Unisys Corp., which, like Digital, is trying to improve its place in the outsourcing pecking order. Unisys' own MIS department remains separate from its outsourcing operation, a company spokesman said.

—*Craig Stedman*

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Tech Talk

Call home

Ameritech Corp. earlier this month said it would test a voice-activated dialing service that would let consumers operate a telephone without pressing a single button. The Chicago phone company will use a patented voice-dialing system from Texas Instruments, Inc.'s Telecom Systems Unit in Austin, Texas, and fault-tolerant Unix servers from Tandem Computers, Inc. in Cupertino, Calif. Ameritech's future voice-dialing option, which could be commercially available as early as next year, will provide a personal voice directory for each household member, with a total of 70 voice-activated names per household.

Mass storage

Last month, IBM Adstar scientists reported they had discovered a way to store up to 10 billion bits of information per square inch of computer disk surface, or a density 30 times greater than current disks. The feat is accomplished by a variation on the so-called "magnetoresistance" effect, whereby the materials in the disk drive's read head change their electrical resistance in the presence of a magnetic field. Adstar scientists were able to produce a "giant magnetoresistance" effect, resulting in a signal five times stronger than current methods. Because of the stronger signal, disk drive heads produced with materials exhibiting the effect should be able to detect magnetic spots that are much smaller and more densely packed than those in current systems, according to IBM. The prototype head has yet to be developed.

T-byte Rex

E-Systems in Dallas announced a commercial patent — its first — for its massive data storage technology, which stores from 5T to 10,000T bytes. E-Systems' commercial products unit, Emass, is already selling massive data storage systems based on the technology.

Looking (back) forward

By Ellis Booker

Technology breakthroughs rarely change the world overnight. Sometimes a heralded advance never achieves its promise; it can be derailed by unseen difficulties or superseded by other approaches.

In any event, a look back to update the fortunes of some "advanced technologies" is a useful exercise. The following are updates on stories that appeared on this page during the past three years:

Warren Wolfard

September 1993: Optical

A "proof-of-concept" fully optical computer, developed and shown by the University of Colorado six months ago, has given researchers there plenty to work on.

"We've reached a plateau level on the experiment and are going back to the theoretical work to understand and extend the techniques," said Harry Jordan, a professor of electrical and computer engineering and one of the development leaders at the university's Optoelectronic Computing Systems Center (OCSC).

The OCSC demonstration was the first of its kind to use light pulses to both calculate and store data elements conveyed along three miles of spooled glass fiber. Each "bit" is carried as a 12-foot light pulse. An earlier system shown by AT&T Bell Laboratories had used an external electronic computer for program control.

Still ahead for the experiment is a multiplex trail, whereby two virtual machines run simultaneously on the same hardware. "Every other pulse will belong to one of the two virtual machines," Jordan explained. Other related projects at OCSC include the development of a high-speed graphics processor that uses light waves in "free space" and the creation of an optical switch to interconnect high-speed computers.

The fully optical computer has been a dream of computer scientists for decades. Theoretically, doing away with physical media (wires and silicon chips) would dramatically increase a computer's speed.

A light-based computer that dispensed with optical fiber to carry the light beams could feature a virtually limitless number of interconnections in free space — the ultimate architecture for a massively parallel system.

September 1992: Speech recognition/translation

After the successful January demonstration of Janus, an English/German/Japanese speech recognition/translation system, researchers at Carnegie Mellon University's Center for Machine Translation are now at work on a more general-purpose, two-person translation system.

Unlike the 400-word Janus, developed to register attendees at an international conference, the two-person system will use an unconstrained vocabulary and allow users to speak more naturally, according to Arthur McNair, a research programmer in neural network speech at Carnegie Mellon.

"Our biggest change is working on spontaneous speech, allowing people to say things like 'ummm' and 'ah' and restart their sentences," McNair said.

The "task" of the new system will be to schedule an appointment, translating sentences such as, "Can we meet next Tuesday at 10 a.m.?" and "No, I have a meeting then" into English, German and Japanese. Eventually, Spanish will be added to the mix.

A public demonstration of the system is a year or two away.

September 1991: Eye-tracking

Despite high hopes two years ago, eye-tracking systems have yet to crack the commercial marketplace to become "the ultimate" computer interface.

The gear is still important to military and research users, however. And affordable, PC-based systems that have come on the market in the past two years are proving a godsend for some disabled persons [CW, Aug. 30].

"There aren't any big markets yet," acknowledged Rikki Razadan, president of Iscan, Inc. in Cambridge, Mass., a vendor that was profiled two years ago. Nevertheless, Razadan said, "There's no question that this technology will show up on user desktops." Immediate future uses include video-game applications.

A year-and-a-half ago, Iscan introduced its Eye-Slaved Pointer system, a tabletop eye-track setup for the disabled. The $15,000, PC-based system comes with software that enables its user to dial a telephone, do word processing and access message boards.

The technology in the PC-based system is based on Iscan's $50,000 to $60,000 military and research products.

September 1990: Project Athena

Back in September 1990, Athena was still an experiment at MIT. By the next July, however, the Unix-based, campuswide computing environment, had been officially merged into the university's information systems group.

Today, Athena is the primary academic electronic resource at MIT and supports some 14,000 students and faculty members. Other changes since 1990 include ports to vendor-specific Unix operating systems, such as Digital Equipment Corp.'s Ultrix and IBM's AIX, and a trend toward using third-party software packages.

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IDC Insight
INTERNATIONAL DATA CORPORATION

New Cost-to-Use Analysis Key to E

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IDC bas developed a better method of evaluatiog costs of computiog. Price/performaoce numbers based oo hardware benchmarks are often extremely poor predictors of the actual computing costs users will face. This is especially true in situatioos where customers are distributing very-complex workloads across an enterprise.

Hardware price-performance benchmarks such as TPC-A provide solid, base-level comparisoos in specialized environments. They don't reflect the complexity of most users' business needs and processiog workloads. Therefore, they have limited value in making realistic buying decisions.

The IBM AS/400, sometimes mistaken as a premium-priced product, emerges as the lowest cost-to-use system in complex, networked, enterprise-wide processing environments

To help IS management better predict the true cost of computing, International Data Corporatioo (IDC) developed a "cost-to-use" model. This model is intended to more-accurately measure and compare the full costs of using four types of leading midrange systems in oetworked, enterprise-wide applications. The systems in the study were: IBM AS/400, DEC VAX VMS, HP UX, and NetWare LANs.

Contradicts Price-Performance Notions

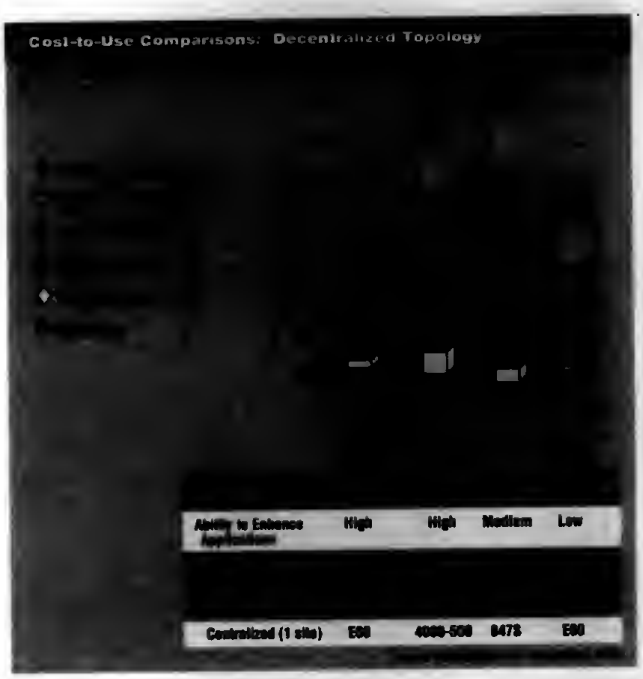
IDC studied more than 150 commercial computer installatioos in the United States. We interviewed more than 30 customers who have installed networked-eoterprise systems to assess the full range of computing costs in complex, eoterprise-wide environments. The model IDC developed from this research includes hardware, system software, application software, developmeot-staff and operations-staff costs, aod all overhead costs associated with remote-systems management performed by a central site over a five-year period.

IDC believes the results of this study provide IS professionals with the best information available on the costs of processing in the most-complex type of computing environment, the networked enterprise. While we doubt that the results of the study will come as a major surprise to those who have fully considered the issues, our data contradicts notions based simply on hardware price/performance figures.

Options

Four major options appear to be available to PC LAN users.

1. Do oothing, and continue to live with existing distributed or decentralized topologies and functionality as they currently exist.
2. Wait for LAN vendors to deliver the needed functionality.
3. Add to operations staff, eveo though this will increase costs out of proportioo to the increase in benefits.
4. Implemeot curreotly available technologies that provide the advaoced functionality not yet available on LANs. While this may result in higher up-front costs, the IDC Cost-to-Use model indicates that this is tbe most-effective choice.



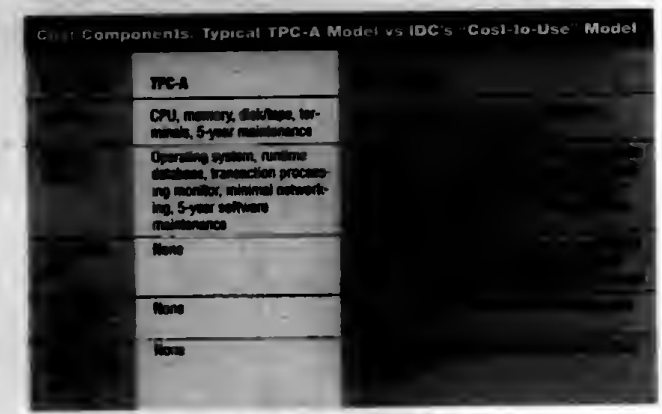
Staffing costs dominate

For example, consider the following:

- Integrated systems-managemeot software services (a series of coordinated tools for admioisteriog local and remote systems) are a major differeotiator for users because staffing expenditures dominate overall cost in the oetworked enterprise.

In a distributed topology, operations-systems staffs for IBM AS/400 and DEC VAX systems cost $36 per workstation per month, roughly a teoth of the cost of a LAN-based system. In a decentralized topology, as opposed to distributed, tbe reverse is true — LANs had the lowest costs for operations staff at $244 per workstation per month. However, IDC believes these staffing costs are likely to rise during the oext two years as the LAN-based applications mature and require reworking.

- Users — even IT professionals — generally lack experience with networked enterprise topologies. The logistics of distributing new software, software updates, physical and electronic support services, and hardware in a networked enterprise are viewed as a major barrier to success. As a result, few users are taking full advantage of the possible benefits of complex, distributed processing.
- The application set on LANs tends to be less-sophisticated than those on minicomputers. Developmeot resources available for minicom-



** Minicomputer-based topology included 60% PCs, 40% terminals. NetWare LAN-based topology included 100% PCs. Source: International Data Corporation, 1993.*

valuating Networked Enterprises

cation Business Systems

puters often are considerably more sophisticated that those available for LANs. Io respoose to rapid changes in business environments, we believe that many LAN-based applications in oetworked enterprises will require significant reworking in the 1993-1995 time frame as the environments move from support roles (i.e. file, print, and electronic mail servers) to full-fledged production applications (OLTP, database, accounting, and data analysis) computers.

- The IBM AS/400, sometimes mistaken as a premium-priced product, emerges as the lowest cost-to-use system in complex, networked, enterprise-wide processiog environments.

The IT industry is currently investing beavily in distributed computing — and rightly so. Distributing processing power while retaming overall cohesiveness is an outstanding strategy for achieving the most-pressing objectives facing IT professionals today: organizational effectiveness, better return oo IT iovestments, increased productivity, and more-rapid exploitation of new technologies.

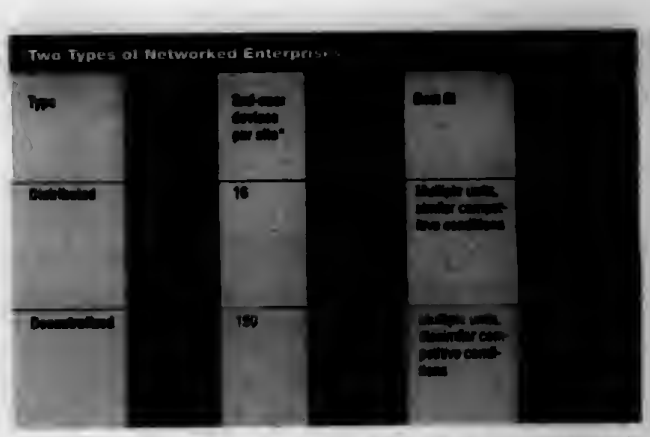
However, distributed processiog is associated with significant complexity and uncertainty. Making the right decision requires higher quality, more-relevant information.

Conclusions

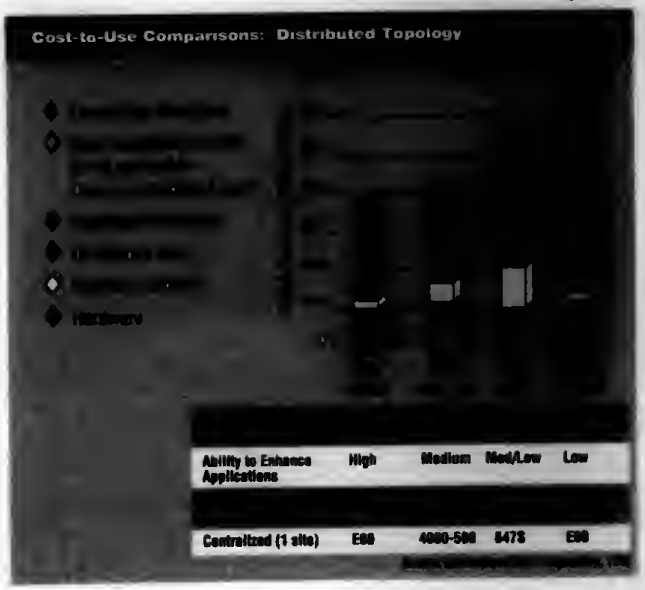
The information technology market is a very-complex place to shop. An expanding variety of hardware, software, and communications technologies, most associated with individual functional capabilities — that offer unique benefits — is being marketed by IT vendors to prospective and current customers. IT professiooals demand better sources, quality and types of information to belp them make the right decisions when plaoning purchases in this market.

Popular benchmark metrics such as TPC-A are specialized indicators of application performance (e.g. OLTP). As systems topologies get more complex, the appropriateness of this benchmark decreases dramatically. But TPC-C and the forthcoming TPC-D and TPC-E benchmarks will provide significaot advances.

Users are exploring more-complex topologies as they attempt to support more-complex business strategies.



** Site size and end-user populations based on survey data. These qualities are used as the basis for all distributed and ecentralized analysis Source: International Data Corporation, 1993.*



The distributed enterprise and the decentralized enterprise, although more complex relative to traditional host-based, fully centralized configurations, are especially attractive to many companies. Comprehending options io these more complex setting, however, requires special costing tools.

IDC applied its Cost-to-Use model to help users better understand tradeoffs between alternatives. From our research, the following conclusions emerged:

- Overall costs-to-use in networked enterprise are very dependent oo staffiog levels. Superior systems-software services allows users to minimize staffing levels at remote sites without also minimizing IT support aod responsiveness.
- IBM's AS/400 and Digital's VAX VMS systems, largely because of their advanced system-software capabilities, are more attractive alternatives to LANs in sophisticated, oetworked OLTP eoterprises. Moreover, our researcb indicates that IBM's AS/400's cost to use is superior even to Digital's VAX VMS offerings.
- The Hewlett Packard 9000 offers excellent pricing at the hardware level. It is being positioned to attack costs of complex topologies aod staffing issues. Its vulnerabilities are io applicatioos software and system software in distributed topologies. In decentralized topologies, HP displays a lack of sophistication in system- and network-management tools relative to IBM aod DEC.
- As customers gaio more experience with complex, networked enterprise topologies, tbey will (1) become more familiar with the logistics and politics of choosing, implementing and managing complex topologies, and (2) they will deploy these complex topologies more often.

Although we feel that the functionality of UNIX and LAN alternatives will iocrease over time, customers looking to take advantage of the benefits of networked eoterprise topologies sbould strongly consider more integrated alternatives.

- Many users with LAN-based, decentralized enterprise topologies will be forced to cbose between continued reliance on aging, less-sopbisticated applications — and the potential competitive disadvantages implied by that choice — or greater staffing costs to rework and maintain their code base. We feel that they will have to choose more staff, despite the added costs, if they retain these topologies.

For a copy of the complete report, "Cost-to-Use of Midrange and PC LAN Systems in the Networked Enterprise," call 1-800-765-0119.

Valley of dearth

At a gathering of SAS Institute users at the company's Cary, N.C., campus last week, the talk was all about client/server. At one point, a SAS saleswoman pointedly asked me, "What is it about the press and client/server? Our customers get all whipped up over this stuff from reading trade journals, and then we have to go in there and tell them how difficult moving to client/server really is."

To quote *Saturday Night Live*'s Mr. Bill: "Oh, noooooo!" I certainly hope we're not guilty of contributing to any happy talk over this most difficult of technology challenges.

But the woman has a point. Users are being sold a bill of goods on client/server, not just by members of the press but by a clutch of consultants, newsletter publishers, market researchers and vendors — *lots* of vendors — whose shortsighted view of client/server's complexity stops roughly at the user's credenza.

Too much attention has been focused on short-term hardware savings and not enough on the cost of people and lack of features. Yes, client/server does let you replace expensive, proprietary computers with cheap, mass-produced ones. But that's about all that's cheap about it. Users on the western front of the client/server wars report the headaches and support costs imposed by unreliable networks, toy operating systems and nonexistent system management tools more than offset the cheaper chips.

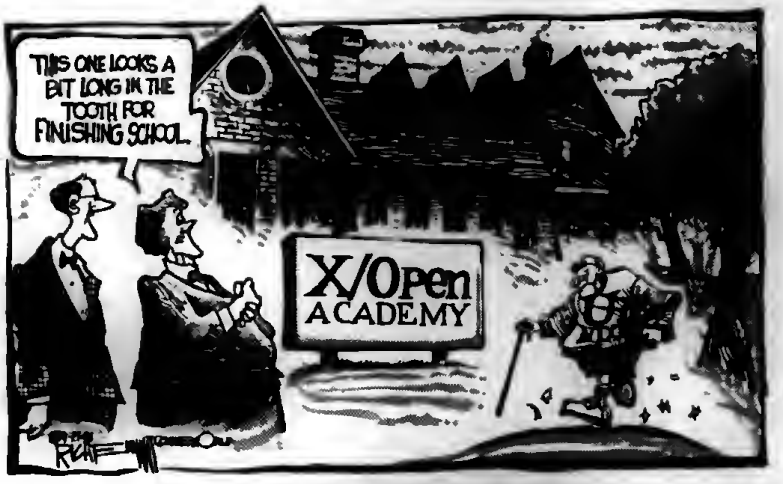
The tough nut about client/server development isn't the client; it's the server. While lots of impressive client/server management and utility products currently exist in press release form, I have yet to meet a user who'll say that these technologies can hold a candle to what's been available on a VAX or a 370 for years. How can they? A distributed network with six potential points of failure is a lot tougher to manage than a host/terminal network with two. As Xerox PARC alumnus Butler Lampson once said, "A distributed system is one in which I can't get my work done because a computer has failed that I've never even heard of." Complexity is the nature of the beast, and we'll just have to live with that.

Ditto for database management, security, backup and recovery, program development and more. Those are boring issues relative to the merits of Visual Basic or SQL Windows, but they're the issues stubbing the toes of IS organizations around the country right now.

That said, why should IS organizations continue to charge ahead into this valley of dearth? Because client/server makes so much sense for business reasons. Flexibility is what client/server is all about. While the short-term costs of a client/server project will almost certainly be higher than a mainframe approach, the long-term savings from greatly reduced training, support and infrastructure upgrade costs will more than make up the difference.

Sorry if we or any of our brethren have made this stuff sound easy. It isn't. But it is the future. Of that there can be no doubt.

Paul Gillin, *Editor*



Notes price is fair, but rework model

Recently I was quoted advocating that Lotus release a much cheaper runtime version of Notes to increase market penetration [CW, Aug. 16]. I want to point out that I think that Notes is worth every penny Lotus charges, and that, given the vast resources Lotus has spent developing it, the price it charges is more than fair.

However, Notes, like the telephone, E-mail or fax machine, increases in value proportionately to the number of users, and I fear it will lose a chance to become the de facto standard by using an economic model that works better for refrigerators than for software. I still believe it would be better for companies to have pricing that encourages them to install Notes on every desktop as soon as possible.

Carolyn Coughlin Weissberg
Genencor International
San Francisco

Frustrating curve

It's understandable why Tim Lynch states that object-oriented technology is easy to grasp in "Object orientation isn't salvation" [CW, Sept. 6]: He hasn't grasped it. Open your eyes to the millions of lines of C code being written in C++, to the unused copies of SmallTalk, to the data flow diagrams being drawn with OOA notation, and you'll see a steep learning curve and many frustrated developers. Object technology *is* more complex and *is* different, and to pooh-pooh the learning curve is to negate the honest efforts of thousands of professionals exploring and applying this new technology.

Reading a book, taking a class and playing around with a visual development tool doesn't qualify you to estimate the effort required to grasp object technology. Please, until you've climbed the mountain, don't tell others how short and flat it is.

G. K. Khalsa
San Diego

Got it; get it?

Your article on the Newton Toolkit [CW, Aug. 23] omitted a key fact that probably led readers to an erroneous conclusion.

The article states that the Newton Toolkit is "scheduled for imminent release." While this is correct relative to the production version, Apple has been distributing the Newton Toolkit beta version since the first week of August. I acquired one on Aug. 5.

T. R. Unkefer
LTV Steel Co.
Cleveland

Try out a new spin

In "Where's CASE when we need it?" [CW, Aug. 23], John Gantz points out a major weakness of most visual development tools: maintenance. I find little to argue with about this. The problem is that each element must interact, creating an invisible cascade effect whenever a major design change is required.

I disagree with Gantz's final conclusion that applications developed with these tools will "crash and burn" two years later. He might have just been making a philosophical point, but it seems more likely he missed the paradigm bus. By applying a different spin to the application life cycle we can turn a maintenance weakness into another advantage!

When a prototype *is* the application, there is never any need for major refinement or maintenance.

But what are we doing instead of maintenance? Why, all the stuff we gave lip service to but never had time for: developing an enterprise data model, documentation, user support, training, business needs analysis, strategic planning, evaluating products, developing marginal needs systems, building test suites....

I have seen the future and it was a *visual* experience.

Jack William Bell
Computer analyst/programmer
Lacey, Wash.

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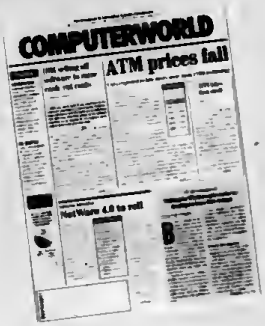

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   70 Mining/Construction/Petroleum/Refining/Agriculture
   80 Manufacturer of Computers, Computer-Related Systems or Peripherals
   85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
   90 Computer/Peripheral Dealer/Dist./Retailer
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   22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data/Tele Comm. Network Sys. Mgt., LAN Mgr., PC Mgr.
   23. Dir./Mgr. Sys. Development, Sys. Architecture
   31 Programming Management, Software Developers
   41 Engineering, Scientific, R&D Tech. Mgt.
   80. Sys. Integrators/VARs/ Consulting Mgt.

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The toppling of an American icon

Joanne Kelleher

Remember that phrase, "Nobody ever got fired for buying IBM?" Sure you do. You probably even used it, although you're too smart to admit it now. These days people *do* get fired for buying in the reflexive, no-questions-asked way that gave rise to the motto.

What became of all the true-blue IS executives who followed IBM down one dead end too many isn't much explored in Paul Carroll's book, "Big Blues: The Unmaking of IBM." But those dead ends are, as are the organizational flaws that helped to topple a once seemingly unbeatable competitor.

Carroll, a *Wall Street Journal* reporter who covered the IBM beat, calls what happened to IBM "a sort of Greek tragedy," and that image certainly fits. But so does another that's not quite so classical: Picture a winter night in the North Atlantic and a massive ship, reported to be "unsinkable," ploughing confidently through icy waters. One of the worst mistakes any company can make is believing its own PR, but IBM believed it with a vengeance.

IBM was convinced the market would always wait to see what it had to offer, even after missing multiple opportunities and receiving clear signals that customers were more interested in price tags than initials. It also insisted that it knew the best way to write software — scattering pieces of a project to a half dozen or so overstaffed teams around the world, virtually ensuring the resulting product would be both late *and* poorly focused.

Every once in a while, a particularly strong personality or unusual set of circumstances would allow a skunk-works operation thrive long enough to pull together an excellent product. But then, even if marketing resistance or political infighting didn't kill it off and the product actually succeeded, it was chalked up as an anomaly, and it was business as usual the next time around.

There aren't many out-and-out villains in this saga, at least of the human variety. The real villain was a system of management that was allowed to thrive for so long it took on life and power of its own. Anyone who wonders, for example, why John Akers didn't move faster, should read the section detailing negotiations to sell the Lexington, Ky., printer division. Akers had to personally intervene more than once to save that deal, and even then, the system, which gave everyone veto power, nearly killed it in the 11th hour.

That was one action regarding one division. Consider the size and scope of the changes required to remake IBM for the times, and then try the math on how long it would have taken without the shock of that $5 billion loss.

There were so many chances for different endings, so many "if onlys" along the way that it's hard not to label what happened willful self-destruction. If only IBM had grabbed the exclusive marketing rights to 1-2-3 that Mitch Kapor offered. If only Bill Lowe negotiated a better deal with Bill Gates in 1985. If only IBM had backed some of its own key research instead of letting others take the risks and the rewards.

This is, as Carroll says, a very sad story.

Kelleher is *Computerworld*'s features editor.

No frills, fewer tangles

COUNTER INFORMATION *by* Michael Schrage

With growing disbelief, I watched a Delta gate agent key in the details of my (completely standard) upgrade. *Click*... *click*... *click*... I lost count somewhere after the 35th keystroke. *Click*... *click*... *click*... It was painful.

Less than a week later, I flew Southwest Airlines for the first time. No upgrades, no boarding passes, no *click*... *click*... *click*. Instead, you're handed an ugly, numbered and color-coded piece of plastic in the shape of California in the order you arrive at the gate, and you board accordingly. Southwest CEO Herb Kelleher swears no-frills ticketing saves his airline millions, is environmentally correct and lets him turn his planes around in half the time it takes American Airlines to do the same. That means more flights per plane per day. That, of course, means more money. For the moment, Southwest is making money. Most U.S. airlines are not.

Sure, Southwest uses computers. Who doesn't? But compared with a Delta, United, TWA or, especially American Airlines, Southwest is an unabashed technological moron. That's not by accident; that's by design.

Southwest's design priority is to create and manage simplicity. Delta's priority is managing complexity. The distinction is crucial. There's a world of difference between viewing computers as a medium to create simplicity and viewing them as the best way to soak up more complexity. Keeping things simple poses a radically different design challenge than trying to manage complexity. Simplicity architectures just don't look like complexity architectures. Think of it as the difference between designing RISC and CISC processors.

This design trade-off between simplicity/complexity is at the core of the systems challenge facing technology professionals today. Does "working smarter" in the 1990s mean making tasks inherently simpler and easier? Or does it mean giving individuals and enterprises the computational tools to better manage increased complexity?

Corporate America is split on this issue. General Electric's Jack Welch vehemently argues that most businesses are too complicated. KISS — Keep It Simple, Stupid — is GE's credo. To Welch, it's clear that complexity is the sworn enemy of cost-effectiveness. In contrast, business gurus from Drucker to Senge to McKinsey & Co. maintain that organizations can't avoid complexity; they have to have the courage, creativity and consistency to manage it. Amoebas don't eat sharks. It takes complex systems to solve complex problems and exploit complex opportunities.

For the most part, software designers have opted to design for complexity. Graphical user interfaces are used to prettify access to complex lumps of data. Query languages and neat data structures artfully conceal complexity. We rarely focus on the underlying complexity because we're getting so much better at cheating with the interfaces. Often, we use software to mirror external complexity because we can, rather than because we should. That often leads to diminishing returns.

There's an awful lot of hoopla today about "re-engineering" corporations and their systems. That would be encouraging if removing excess complexity were part of what's driving the movement. It isn't, though. Re-engineering is all about cutting costs. We're just so conditioned to the idea that value comes from additional functionality, that most organizations honestly believe they can't afford to stay simple in an increasingly complex world.

The sad truth is that most CIOs have gotten into the fixes they're in by promising to tame complexity. Perhaps they'd be better off if they emulated Southwest and used technology as a bridge to The New Simplicity.

Schrage is a fellow at the MIT Sloan School Center for Coordination Science and the MIT Media Lab. His Internet address is schrago@media-lab.media.mit.edu.

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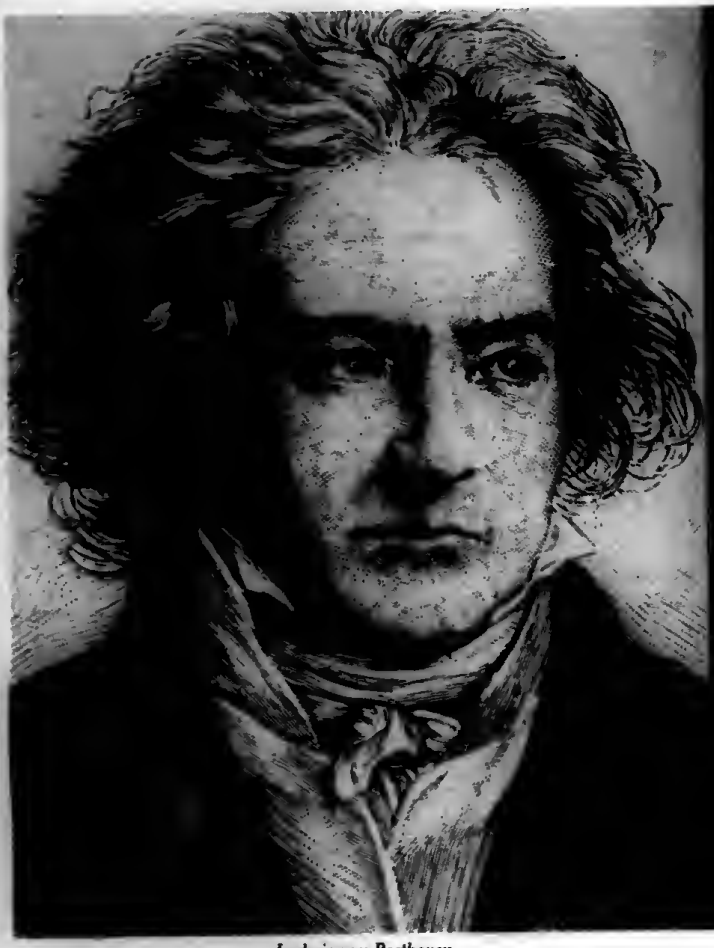

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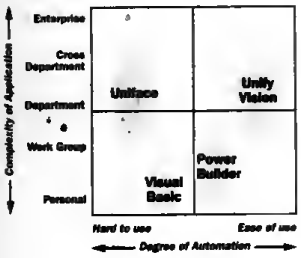

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Compaq hopes combo portable strikes chord

By Michael Fitzgerald
HOUSTON

Compaq Computer Corp. is counting on its recently released Concerto pen and keyboard portable PC as the company treads into new territory.

Besides allowing a pen and keyboard to be used in concert, Concerto represents many firsts for the company. It is Compaq's first effort with pen input, the first Compaq product to support the PCMCIA standard and the first effort to bundle Compaq-specific software with a portable.

Trying to avoid the stigma of pen computing and comparisons with Grid Systems Corp.'s Convertible, Compaq is billing Concerto as a notebook that happens to have pen capabilities. It does, in fact, look like a pen-based system with an attachable keyboard.

"I consider it a convertible because it combines pen and keyboard," said John Fell, PC LAN specialist for sales systems at the Moore Business Forms and Systems Division of Toronto's Moore Corp.

Fell said he currently has 30 Grid Convertibles in the field and is testing Concerto as a 486-based replacement for those systems.

Eye-catching setup

Whatever it is, Concerto will at least draw some looks. Its detachable keyboard sits at a desktop-like 10 degree angle when in notebook format. A handle attached to the screen props up the display and allows for easy adjustment of the display angle.

The pen, besides acting like a pen, also replaces the mouse.

Compaq's Concerto

Processor: 25-MHz or 33-MHz 486SL.
Weight: 4½ pounds, 5.2 without the keyboard.
Hard disk: 40-MB or 80-MB hard disk.
Slots: One Type III PCMCIA; pen port interface.
Battery life: Three to four hours.
Bundled software: Windows for Pen Computing, Ink Development's NoteTaker, Slate's PenPower for Excel.
Base price: $2,499.

Fell said the pen is a plus for his users. "For our sales automation project, we need the flexibility of having full keyboard capability but want to use the pen for some situations," Fell said.

Late entry

Compaq's use of the PCMCIA standard brings the company in line with portable computing's major players. Compaq has attempted to make up for its tardiness in implementing the standard by building in a utility that posts information on whatever PCMCIA card is in use.

The utility will turn off power to the power-hungry cards when they are not in use. A Compaq official said this could save as much as 30% of the battery life.

Included with Concerto is DOS 6.0, as well as Microsoft Corp.'s Windows for Pen Computing, Ink Development Corp.'s NoteTaker memo program and Slate Corp.'s PenPower for Excel, a new utility that makes Microsoft's Excel spreadsheet program work exclusively with the pen. The Ink and Slate products were developed with some input from Compaq. The products will sell on retail shelves and for the first year Compaq will be the only hardware vendor that can bundle them.

While Compaq bills Concerto as a notebook, Compaq executives were quick to say that future products in its flagship LTE Lite notebook line will not have the same feature set as Concerto.

Separately, Compaq cut prices on its LTE Lite family by up to 18%. A base model LTE Lite 4/25 now costs $2,199 with a 120M-byte hard drive.

Quattro Pro for Windows excels despite learning challenges

By Garry Ray

It is hard to imagine that a full-featured, competitive spreadsheet could be had for a paltry $50. But Borland International, Inc. in Scotts Valley, Calif., has pulled it off once again with Quattro Pro 5.0 for Windows.

PRODUCT test RATING QUATTRO PRO

The company, which rose to acclaim a decade ago with its dirt cheap Pascal compilers, is known for stuffing tons of features into low-cost packages. Witness its series of under-$100 databases, Pascal and C++ compilers, debuggers and other technically advanced software tools. With all that technical backing, it should come as no surprise that Quattro Pro 5.0 includes the same polished advancements as other Borland products. But polished does not necessarily mean perfect, and some design issues in Quattro Pro 5.0 could stand improvement.

Feature-rich

On the plus side, Quattro Pro 5.0 is a power-packed Windows spreadsheet that includes just about every conceivable analytic and presentation feature users might want. Of course, the spreadsheet includes the standard array of @ functions (more than 360, according to Quattro Pro documentation) and macro commands, along with the standard font, styling and presentation capabilities conferred by Windows. However, these obligatory spreadsheet features are bolstered by additions such as data modeling tools similar to Lotus Development Corp.'s Improv; "experts" that automate activities such as charting and spreadsheet consolidation; and on-line, interactive tutorials.

A $495.95 version of the spreadsheet (dubbed the Workgroup Edition) permits data sharing through LANs and telecommunications networks.

With all these new features, Quattro Pro for Windows presents a formidable learning challenge even to experienced spreadsheet users. Some of this is eased with a series of on-line, interactive lessons called SpeedTutors that are targeted at new spreadsheet users. But with topics such as "Entering numbers" and "Moving a block," these are far too basic to cover the complex questions experienced users might ask. There is no similar coverage for the sophisticated data modeling tool, the scenario manager or for most complex spreadsheet questions.

Another learning aid is the set of Quattro Pro Experts, which provide step-by-step guidance for creating graphics, building scenarios, consolidating worksheets, compiling formulas and building statistical analyses. The Experts ask a series of questions and ultimately produce the desired result. These will be of use to both novice and advanced users.

Quattro Pro Experts *give users step-by-step guidance for creating graphics and performing other functions*

Like all contemporary spreadsheets, the Quattro Pro features list is extensive. Matching its primary competitors — Lotus' 1-2-3 for Windows and Microsoft Corp.'s Excel — Quattro Pro also includes a graphical draw layer with a complement of drawing tools, drag-and-drop of selected spreadsheet blocks, automatic block formatting and an automatic chart building feature.

On-line inspector

Block and cell operations are augmented by Borland's Object Inspector, which is invoked with the right mouse button. The Object Inspector provides access to a variety of operations according to the type of object being examined.

For example, the Object Inspector presents a pull-down menu to allow formatting, charting or editing operations if a block of cells is "inspected." If a notebook tab is selected, the Object Inspector will provide a menu of changes that can be made to notebook characteristics such as protection, spreadsheet grids and default numeric formats.

Those who customize spreadsheets for others will appreciate the array of tools to create menus, macros and custom SpeedBars (Borland's equivalent of Lotus' 1-2-3 SmartIcons). The macro creation tool allows keystroke capture and editing, and macros can be linked to spreadsheet "buttons" for point-and-click macro execution.

While it is difficult to criticize any product that delivers the range of features and functions found in Quattro Pro for Windows, users might be surprised by the number of "hidden" features they must unearth to use the spreadsheet to its fullest potential.

For example, we were becoming concerned about the time needed to "grab" a selected block for movement to another section of the spreadsheet. It was only in a passing reference in the documentation that we discovered that "delay time" can be adjusted using one of the Object Inspectors.

In operation, Quattro Pro 5.0 was rela-

Quattro Pro, *page 42*

Macintosh users get ready for Unix

By James Daly

It is never too early to plan for what is coming around the next technological bend, and for a lot of Apple Computer, Inc. Macintosh users these days that means Unix.

By the middle of next year, the Apple/IBM technological alliance will unveil one of its bedrock technologies: PowerOpen, a next-generation Unix. Though it sometimes gets lost in all the noise about Taligent and PowerPC, PowerOpen will likely be just as important.

Many users reportedly hope the Macintosh's traditional ease of use will make it easy for users to embrace Unix. Although Unix offers tremendous flexibility to skilled practitioners, its technical intricacies have scared potential users.

"The complexity of Unix can be quite daunting," said Robert Keim, director of information, management and system technology at the College of Business at Arizona State University in Tempe.

Unix difficulties

Apple has had a Unix offering since 1989, when it introduced A/UX. The problem with A/UX, however, is that like most Unix versions it is not immediately intuitive. Thus, its user base has mostly been limited to the scientific and academic user communities.

By weeding out those technical challenges — and adding many more applications to the existing A/UX software base — PowerOpen could help change those demographics, initiating a rapid growth of Unix in corporate Macintosh shops. The MacIS user group even plans a special session to discuss PowerOpen at its November conference in Orlando, Fla. Some users said they also plan to develop training classes during the next few months to acclimate users to Unix.

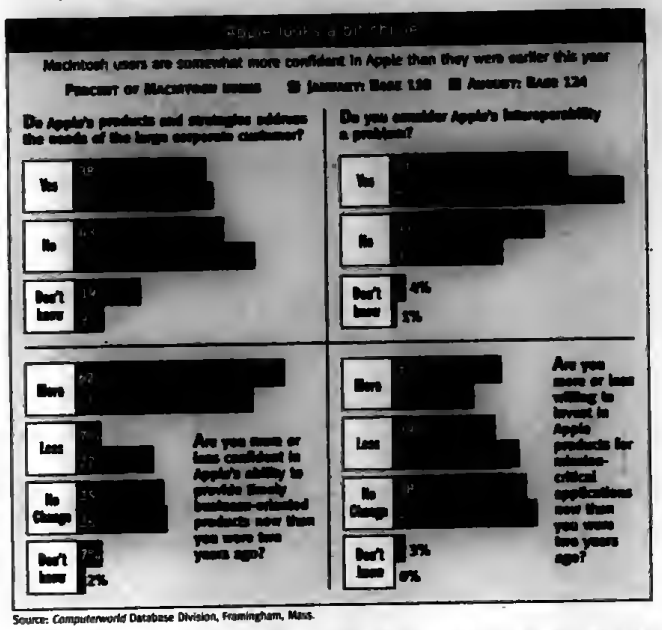
"We have high hopes for PowerOpen," said James Yip, who supervises more than 3,000 Macintoshes as a manager of technical services at Ernst & Young in Toronto. Yip said his organization brought in 30 Apple Workgroup Server 95s early this month, giving many users their first taste of Unix. "If [PowerOpen] works, it will insulate users from the complexity of Unix, while still giving [them] access to its power," Yip said.

PowerOpen will be based on IBM AIX 4.1 but will also encompass elements of A/UX. Users will need a machine running a PowerPC chip to take advantage of PowerOpen. Apple and IBM officials have also promised backward compatibility for A/UX and AIX applications.

PowerOpen is enjoying wide support in the industry, with more than 100 players such as Thomson SA, Bull HN Information Systems, Inc. and Harris Corp. committed to shipping PowerOpen-compliant systems.

PowerOpen will also ship with a widespread application base: More than 12,000 existing AIX applications and thousands more A/UX applications will reportedly run on the platform.

The PowerOpen specification is still under development and should be completed by the first quarter of next year, according to Pat Riemitis, vice president of marketing at the PowerOpen Association in Burlington, Mass. Full availability of PowerOpen is expected by next June.



Source: Computerworld Database Division, Framingham, Mass.

What's next

Apple also has other irons in the Unix fire. At its developer's conference in May, Apple announced that it is cooperating with IBM, Sun Microsystems, Inc., Hewlett-Packard Co. and Unix System Laboratories, Inc. to put the Macintosh user interface on machines running Unix. The payoff would be that programs written for the Macintosh would be able to run, unchanged, on Unix workstations.

Specifics were hazy: No time frame was announced, nor were Apple officials certain whether users would require two sets of tools to build front-end services for Macintosh and Unix applications.

Some analysts said this approach could backfire, particularly with companies that have many Unix machines in place.

"It's a strategy that could actually blow up in Apple's face if it's not careful," said Tim Harmon, program director for desktop computing strategies at Meta Group, Inc. in Westport, Conn. "Why pay for a Macintosh when you can get a much cheaper Unix box with a Mac interface?"

Harmon said that while a Macintosh designed for Unix might cost $2,000 or more, a Brand X workstation could undercut that price by $500 or more.

Still, many users said they think Unix is going to be a big part of the Macintosh's future. "You have to look out three to six years," Keim said. "And I think you'll see that PowerOpen will be a key part of many corporate Mac shops."

Quattro Pro

CONTINUED FROM PAGE 41

tively speedy and on par with 1-2-3 Release 4.0 for Windows. But users might bristle at the nearly 16M bytes of disk space required for program installation. Granted, that space delivers a lot of features. But users are advised to run Quattro Pro using the Windows SmartDrive disk cache because on our system the program was constantly swapping program modules to and from the disk.

The flip side of Borland's vaunted object-oriented technology is that you will need plenty of hardware resources to use it to its fullest.

In all, Quattro Pro 5.0 for Windows delivers the sort of features and performance for which Borland is recognized. Certainly, there are more than enough features to keep Quattro Pro in the spreadsheet competition with Lotus and Microsoft. But as always, this new version of Quattro Pro also offers enough enhancements and added features to prove that Borland still knows how to up the ante.

Compaq tries for bite of Newton pie

By Michael Fitzgerald
HOUSTON

Compaq Computer Corp. said it would use a little help from its friends to build its answer to Apple Computer, Inc.'s Newton personal digital assistant.

Accordingly, Compaq, Microsoft Corp., Intel Corp. and VLSI Technology, Inc. have announced a cooperative effort to develop Mobile Companion, a new handheld device that will use a new operating system from Microsoft and a new chip set co-designed by Intel and VLSI. The firms have not, however, committed to when the handheld device will be delivered.

The partnership will take a significantly different tack from Newton, one analyst said. Newton "is for taking down new data and transferring it to the desktop, while Mobile Companion is a way to manipulate data already on desktops and LANs," said Randal Giusto, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

Microsoft's operating system is At Work for Mobile Companions. Codenamed WinPad, it was recently licensed by Toshiba Corp. and also ties in to Microsoft's strategy for putting the Windows interface on office equipment.

At Work will maintain compatibility with Windows through a subset of the Windows application programming interface, but it will be different from Windows, said Steve Ballmer, Microsoft's senior vice president of sales. For instance, "the current user interface with overlapping windows is probably not appropriate" for At Work, Ballmer said.

Also, while At Work can communicate with current Windows applications, it will not be able to run them, he added. The operating system will be burned into read-only memory to cut down on battery use and eliminate the need for drives to store it.

Microsoft is scheduled to deliver a preliminary software developer's kit this week at its developer's conference, according to Bjorn Hovstadius, group product manager of handheld systems at Microsoft.

The Intel/VLSI chip effort came to light last week when the companies unveiled the Polar chip set, a version of Intel's 80386SL with more functionality integrated on-board the chip.

Compaq did not say when it would ship its Mobile Companion, nor was it clear whether Compaq would be the first to ship one. Officials from the four firms said they were attempting to create momentum behind a standard that would make it easier to build and bring these types of devices to market.

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W. D. Riley

Where are my color notebooks?!

It's time for the big computer manufacturers to put up or shut up, and they can start with color notebooks.

It's been about a year since the active-matrix color notebook computer was introduced, and I suspect the only way you can get one involves a disembodied voice whispering "psst" from an alley.

Product introductions used to be simple from the buyer's point of view. Someone invented something, produced it, advertised it and sold it. This system worked pretty well, but stand by, because it seems the computer industry, already known for its "guess your shipping date" attitude, has a few changes in mind. Apparently, vendors think the way the process should work is that you invent something, advertise it, presell it and then scramble around for enough parts to put a few together. Sadly, computer buyers are sitting on their hands and simply accepting this egregious behavior when they ought to be protesting loudly and switching computer companies.

There can be no finer example of this nonsense than IBM and Compaq and the color notebook fiasco. Forget the minor ProLinea shortage, a foreseeable mistake that probably sent many Compaq customers screaming into the night. And forget the yearly shortages that plague our industry, jack up prices (big surprise) and slow down deliveries.

This time it's personal.

As simple as this problem seems, it is apparently beyond the control of these two companies. While Compaq and IBM supposedly produce their own notebooks, they rely on outside sources for the most critical part of the box — the color monitor.

Wildly anticipated

While the creation of the 486 notebook wasn't exactly a feat of engineering derring-do, the active-matrix monitor was pretty heady stuff. For the first time since the beginning of the computer revolution, the portable computer user would have a fast machine *and* a great monitor. Early reports had it looking better than the equivalent full-size VGA monitor, and while that may be stretching the facts a little, it was much better than anything that had preceded it.

To the mobile user, it was the dream desktop replacement. All Compaq and IBM had to do was get the thing to market. The rest would have taken care of itself.

But somehow these wise and powerful companies didn't see the shortage coming. If the facts are any witness, no one had the foresight to ask the people making the monitor one simple question: "Just how many of these things can you guys make?"

Disasters such as factories burning down aside, this kind of thing is just inexcusable. I have my own problems. As a corporate buyer, I base long-range decisions on incoming equipment. Projects are defined, people are shifted and software is ordered on the assumption that the equipment will arrive on time. Furthermore, I have clients who have waited patiently for months now, and I have to tell them there are still no color portables in sight.

This fumble, following the ProLinea shortage from Compaq and IBM's inability to deliver its ValuePoint products, will cause me to take a closer look at Dell, Gateway and other manufacturers with more foresight.

Somebody should have seen this one coming.

Riley is microcomputer support manager at the City of Hope National Medical Center in Duarte, Calif.

Conner broadens storage strategy

By Stephen P. Klett Jr.

Conner Peripherals, Inc. in San Jose, Calif., recently unveiled a marketing strategy and product set aimed at bringing the company back into the black after a series of quarterly losses.

Conner's "Storage Solutions Initiative" targets four markets and customer classes: entry, value, performance and portable. New and refreshed products range from disk drives to hierarchical storage management systems with capacities and price points specific to each segment. These products will gradually phase out Conner's current product set.

"Right now we have too much supply for our current demand," said Chief Executive Officer Finis Conner. "Couple this with the transition occurring from low-capacity to high-capacity drives and the PC price wars and you have all the condiments for a tough situation. This strategy marks an attempt to rid ourselves of products that are stuck in price free falls."

Beyond disk drives

The initiative is an extension of Conner's announcement in June 1992 that it would extend its business to become more than a disk drive manufacturer. The move into the tape and software markets was fueled by its December acquisition of Archive Corp.

"If you are just in any one of these markets — given the present level of competition — you end up selling your product by the pound," said George Rea, executive vice president at Conner's Storage Systems Group. "It's a deadly strategy to continue selling along one product line."

This appears to be the case for Conner, which posted losses of $22.5 million and $58.8 million for the first and second quarters, respectively, and has projected a loss for the third quarter as well.

CEO Finis Conner: *Strategy is an attempt to get rid of products stuck in price free falls*

Analysts said the initiative shows that Conner — once the fastest growing disk drive manufacturer in the U.S. — has realized that its heyday in the disk drive market has ended and that it has to find other avenues for growth.

"They're in a tough hole to get out of," said Phil Devin, a senior industry analyst at Dataquest, Inc. in San Jose, Calif. Devin said he believed Conner had chosen the proper path to return to profitability but added it would be a slow climb. "They have all the resources in place, but the question remains as to how soon they can deliver the new products in quantity."

Conner acknowledged that the company can no longer count on growth in disk drives sales and that tape now represents Conner's largest market opportunity for the future. While Conner said only 5% of PCs shipped last year had a tape drive added after market, he expects this to jump to 20% during the next couple of years and believes this initiative positions Conner to take advantage of this growth.

The new strategy "helps us turn things around quicker for our customers," said Felix Lomangino, principal at Computer Partners, a disaster avoidance and recovery company in Mobile, Ala. "It solves the logistic problem of having to figure out who's got what where."

Lomangino said he believed Conner's strategy to focus on the tape market was sound. "We've seen demand for tape products really escalate, which is driven by hard drive media. It's very hard to back up 500M-byte drives on floppies; people are very open to tape for backup and recovery solutions."

Burstless data transfer optimal for audio/video

By Ellis Booker

Hoping to satisfy the rising interest in multimedia, disk drive maker Micropolis Corp. in Chatsworth, Calif., last week introduced a line of what analysts said are the first magnetic drives designed specifically for digital audio/video applications.

The 3½-in. 2200 AV Series drives, which offer storage of 1.05G and 1.76G bytes, have been optimized to deliver data in long, sequential blocks.

Standard drives transfer data in bursts, which, while suitable for data processing applications, can cause trouble for digital video applications that require a minimum sustained data transfer rate of about 3M byte/sec.

Micropolis uses the latest SCSI technology to achieve a maximum sustained and uninterupted data rate of 2.9M byte/sec.

Micropolis claimed that its new drives will save users the expense of extra hardware, software and RAM cache buffers, which today compensate for delays in transferring digital video streams off magnetic media. "We believe getting the tools right is half the battle," said David Guo, Micropolis marketing manager.

In the lead

Bob Katzive, vice president of Disk/Trend, Inc., a research firm in Mountain View, Calif., noted that some optical disc drive makers have attempted similar firmware changes to their products. "But I believe Micropolis is the first with a complete effort for a magnetic drive," he said.

Katzive said he is not sure, however, whether other makers of high-capacity drives will follow Micropolis' lead.

The 2200 AV Series 1.76G-byte drive will cost 2,440; the 1.05G-byte version is priced at $1,642. Both drives will be available next month.

Briefs

Apple success

Apple Computer, Inc. Chairman John Sculley said Apple's Newton MessagePad has sold 10,000 units in its first month of availability, despite reports of power problems and handwriting recognition difficulties. Full national availability of the MessagePad, however, only began earlier this month.

Database deal

Software Publishing Corp. in Santa Clara, Calif., recently dropped prices on its Superbase 2.0 Windows relational database management system. Current Superbase users can upgrade to Release 2.0 for $99, which is priced the same as Lotus Development Corp.'s Approach database. Single-user pricing for Superbase is $495, reduced from $795. A single license for Lotus' Approach is $396.

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Software

The Pendulum Group, Inc. has announced Version 2.0 of the Auto-Might Professional, an automatic event processor and keyboard macro package that permits users to schedule programs to run automatically when a computer is unattended.

Version 2.0 consists of two memory-resident utilities, a keyboard macro utility called AutoKey and an event processor, according to the Englewood, Colo., company. The utilities can be used together or independently.

Features include an expanded keystroke field, a "record mode" that memorizes keystrokes to be used in events or as hot keys, security options, larger event files, additional network compatibility, DOS 6.0 compatibility and easy-installation procedures.

Auto-Might Professional costs $169.

▶ *The Pendulum Group*
(303) 781-0575

Agfa, the imaging division of Miles, Inc., has introduced Version 1.1 of its FotoTune Color Management Software.

Enhanced color capabilities for Macintosh and PC platforms are provided in this version.

According to the Wilmington, Mass., company, FotoTune 1.1 Color Management Software delivers color consistency across a range of devices, including monitors, scanners and printers. Features for the product include a Tag Image File Format importer and scan plug-in module, calibrator software, compatibility with Apple Computer, Inc.'s Apple Colorsync and new color tags.

FotoTune 1.1 costs $795.

▶ *Agfa*
(508) 658-5600

Hardware

Quantum Corp. has announced the Go-Drive GLS series of 2½-in. hard disk drives for subnotebooks and standard-size, advanced notebook computers.

According to the Milpitas, Calif.-based company, the drives offer capacities ranging from 85M to 256M bytes, a selection of drive heights from 12½mm to 19mm and a variety of features designed to boost drive reliability and ruggedness.

Single unit pricing for the Go-Drive GLS series 85M-, 127M-, 170M- and 256M-byte drives is $250, $300, $350 and $425, respectively.

▶ *Quantum*
(408) 894-4000

Identity Systems Technology, Inc. has announced Identity, a 486SLC-based notebook computer that features a 500M-byte Maxtor Corp. hard disk with an access speed of 8 milliseconds, according to the Richardson, Texas-based company.

Identity's features and options include a Cyrix 486SLC/33-MHz microprocessor, a built-in 3½-in., 1.44M-byte high-density floppy disk drive, a socket for optional math coprocessor chip, 80-column by 25-line text resolution, two nine-pin serial ports and one parallel port.

Identity costs $2,995 in a configuration with 4M bytes of RAM, MS-DOS 5.0, Windows 3.1 and MS-Works.

▶ *Identity Systems Technology*
(214) 235-3330

Logisys, Inc. has introduced the VAR 486SLC/33-MHz Dual Scan Color and the VAR 486SLC/33-MHz Active Color, high-performance flexible notebooks.

The models are based on the Cyrix 486SLC/33-MHz chip, and they come with 4M bytes of RAM, a 200M-byte hard disk and built-in coprocessor, according to the Anaheim, Calif.-based company.

MS-DOS is preinstalled, and each model weighs 6.6 pounds. Options for both models include a second RS-232 serial port, trackball, fax/modem and Ethernet 10Base-T.

The VAR 486SLC/33-MHz Dual Scan Color and the VAR 486SLC/33-MHz Active Color cost $2,350 and $3,299, respectively.

▶ *Logisys*
(714) 693-1888

Dolch Computer Systems has announced the Rack-300 series of ruggedized, 14-slot, rack-mount PC platforms.

According to the Milpitas, Calif., company, the use of onboard parallel and serial ports, SCSI connections and integrated drive electronics reduce the need for plug-in boards. The systems deliver up to 27½MIPS, Dolch said.

Pricing for the Rack-300 systems begins at $2,900.

▶ *Dolch Computer Systems*
(408) 957-6575

Product shorts

Delrina Corp. has announced updated Windows and Macintosh versions of The Far Side Daily Planner and Calendar Publisher, an electronic theme-based daily planner with a year's supply of animations and cartoons. The Far Side Daily Planner and Calendar Publisher features an address book, file importing and exporting, and sorting, searching and printing capabilities. Integration with Delrina's WinFax Pro is provided. Cost: $59.95. Delrina, Toronto (416) 441-3676.... **ATI Technologies, Inc.** has introduced Graphics Ultra Pro VLB, a VESA local bus graphics card that employs ATI's mach32 graphics controller. The card can display high-resolution graphics up to 1,280 pixels by 1,024 pixels at 74 MHz and up to 16.7 million colors at 800 pixels by 600 pixels. Cost: $499. ATI, Toronto (416) 882-2600.... **Timeworks, Inc.** has introduced Timeworks Translate It, a series of whole-document, bidirectional, foreign language translation programs for DOS-compatible computers. Available in three versions — English to/from Spanish, English to/from French and English to/from German — the product can translate entire documents at once with full-sentence, idiomatic accuracy. Cost: $99.95. Timeworks, Northbrook, Ill. (708) 559-1300.

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SQL Server users: Happy but hesitant

By Kim S. Nash
REDMOND, WASH

Early users commended Microsoft Corp.'s SQL Server for Windows NT database but said that a single adequate product does not make client/server computing a viable scheme.

Initial pilots of NT and its accompanying database left several users saying they were basically happy. However, rollout of satisfactory test bed applications to the enterprise level depends on several factors, both within and beyond Microsoft's purview, users said.

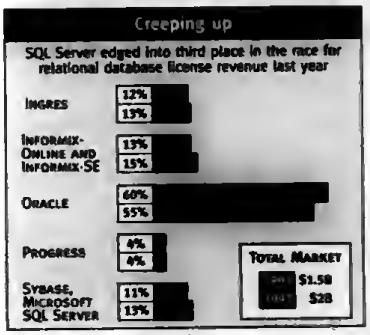
For example, compatible and affordable hardware is a sticking point for Chevron Canada Ltd. Windows NT "needs a pretty big chunk of hardware to perform," said Bill Soper, manager of information services. For pilots done so far, the oil company has run NT on 486-based machines with 32M bytes of RAM.

The Vancouver, British Columbia-based firm plans to move a 60-user order entry system used in its wholesale unit from IBM's OS/2 to Windows NT. However, the switch may be in a holding pattern until IBM certifies its Model 295 multiprocessing servers to run NT, which is expected by the first quarter of 1994.

For future NT-based systems, Soper is considering servers from Compaq Computer Corp. instead. Chevron plans to move several mainframe-based applications to NT — not Unix and not OS/2.

The company chose Windows NT because it wanted a foundation for client/server computing that is as vital to the vendor as it is to Chevron, Soper said.

"It's obvious that NT is Microsoft's key product moving forward. They can't afford to let this fail," he said. "So we'd be left behind if we didn't go [from OS/2] to NT."



Source: Montgomery Securities, San Francisco

For its part, Microsoft contends that SQL Server for OS/2 is in no danger. "The product will keep pace [technologically] with the NT version," said Gary Voth, SQL Server product manager.

NT's sheer newness put off other Microsoft users. "I would never start with a new Microsoft product. They're notorious for putting out buggy systems," said Howard Roth, head of information systems at Gymboree Corp., a children's clothier in Burlingame, Calif.

Roth cited early and ongoing problems with Windows 3.1, such as unexplained error messages and system crashes. Gymboree runs Sybase, Inc.'s Unix version of SQL Server.

Patiently waiting

On the other hand, Goodwin's & Sons plans to bet the business on NT — but not yet. The grocery chain awaits results of a carefully contained, 10-user pilot at its flagship store in Crestline, Calif., owner Martin Goodwin said.

Goodwin and a Microsoft-recommended third-party consultant built an integrated sales and accounting system using Microsoft's Access and Visual Basic. Neither of Goodwin's existing point-of-sale (POS) system suppliers — IBM and NCR Corp. — offered such an integrated application. Because Goodwin's already used several Microsoft products, including Visual Basic, Word and Excel, the company opted to continue down the Microsoft lane by buying NT and SQL Server, Goodwin said.

The NT-based system collects data from checkout stands, such as fast-selling items and the ratio of cash to check to credit-card sales, and integrates that information with the

SQL Server, *page 53*

On the agenda

Chevron Canada plans to move several mainframe applications and one OS/2-based system to Windows NT. It will start with a 60-user order entry application when IBM certifies Model 295 superservers for Microsoft's NT operating system, which IBM promised for first-quarter 1994.

Goodwin's & Sons is testing an NT-based POS system at a 10-user flagship store. The homegrown NT application will replace an IBM and NCR POS setup that lacked integration with the grocer's accounting software. Checkout stands are equipped with 486-based 66-MHz PC s.

EIS vendors adopt SQL to push client/server

By Michael Vizard

■ Four major suppliers of executive information systems (EIS) are adding SQL interfaces to their offerings as part of a drive to accelerate the replacement of mainframe-based EISs with client/server software.

Vendors adding support for SQL include Pilot Software, Inc. in Boston, Information Resources, Inc. in Waltham, Mass., Planning Sciences, Inc. in Littleton, Colo., and Comshare, Inc. in Ann Arbor, Mich.

According to International Data Corp. in Framingham, Mass., Comshare has a 50% share of the EIS market, compared with 15% for Pilot and 10% for Information Resources.

The addition of SQL interfaces to these products is intended to give users the ability to directly browse and read data stored in a SQL database, as opposed to requiring database administrators to replicate data into a separate database that must be maintained and updated.

"Right now we do a lot of extracts and downloads of data into spreadsheet files and text files. In the future, we'd like to be able to let people go directly against the data locked in the SQL databases," said John Doucette, vice president of information systems at Bay State Gas Co. in Westboro, Mass.

In the short term, Bay State Gas will probably use the SQL interface to give users read access to data stored on its mainframes from within Pilot's LightShip offering. But over time, Doucette said, he expects that Bay State Gas will be able to eliminate its need for a mainframe altogether.

More than one option

Pilot has two products with SQL front ends. One is its traditional Command Center Plus mainframe-based system, which runs on IBM mainframes and Unix systems from IBM and Hewlett-Packard Co. The second offering is the LightShip series, which includes a set of analysis tools for Windows systems that are linked to the LightShip server database.

Users can apply the Windows tools against data downloaded to the LightShip server or use the tools directly against data stored in as many as 20 SQL databases using either native drivers from Pilot or drivers from Q+E Software, Inc. in Cary, N.C.

Meanwhile, Comshare is also moving to improve SQL access by adding support for 21 SQL drivers. To do so, Comshare is using software from Q+E Software in its Commander EIS product line.

Unlike Pilot, the Comshare client/server product is based essentially on the same code base as the company's mainframe software.

Comshare has also added an implementation of its multidimensional spreadsheet module to its EIS, aimed at profit and loss analysis.

Similarly, Information Resources has added SQL support to its EIS package in addition to support for Windows, Windows NT and Open Software Foundation Motif clients. However, the SQL interface from Information Resources supports only the SQL Server database from Sybase, Inc. and Microsoft Corp., and that interface will not be available until the fourth quarter.

Meanwhile, Planning Sciences expects to add support for SQL drivers from Q+E this October.

Gentium, a new EIS offering from Planning Sciences due out in November, will use object technology to allow users to reformat data without the aid of information systems professionals, according to Bill Hopkins, vice president of marketing at Planning Sciences.

Comshare's Commander uses software from Q+E Software

Gentium is based on an object file system that allows the company to add data access modules by encapsulating them into an object that is then linked to the Gentium database. Users can then define data as a set of objects that can be easily shared with other Gentium users.

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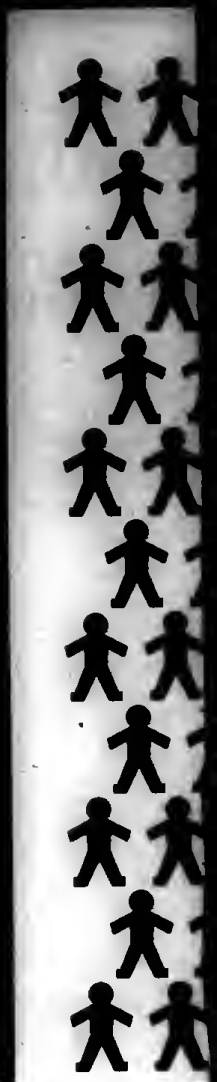

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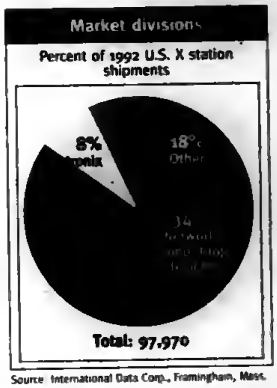
HP replaces X terminal line

By Jean S. Bozman
CHELMSFORD, MASS

Hewlett-Packard Co. last week announced that it is replacing its entire 4-year-old line of X Window System terminals with a multimedia-capable line called Envizex.

The move, which analysts said is intended to boost HP's 20% market share, was accompanied by the announcement of two 75-MHz HP 9000 Model 700 Unix workstations and two 100-MHz Unix workstations for industrial applications. HP, which is second to Network Computing Devices, Inc. in Mountain View, Calif., in global X terminal shipments, is already ahead of Unix workstation rivals IBM and Sun Microsystems, Inc. (see chart).



Source: International Data Corp., Framingham, Mass.

Now HP plans to convince information systems managers that they can reduce the cost of Unix computing by buying X terminals and workstations in a volume package deal, analysts said.

"They're moving to provide all of the user interface facilities that you get with a workstation at the X terminal level," explained Andrew Allison, an independent consultant based in Carmel, Calif.

Eileen O'Brien, an analyst at International Data Corp. in Framingham, Mass., said HP shipped 193,000 X terminals last year but will ship nearly 300,000 in 1993.

The Envizex X terminals will range from $1,995 for a 14-in. color terminal to $5,595 for a high-performance 19-in. color unit. They support shared whiteboard, audio and scanning features, and they can be linked to X servers from IBM, HP, Sun and The Santa Cruz Operation.

New editions

At the same time, HP is adding 75-MHz versions of the HP 9000 Model 700, Model 715 and Model 725 workstations, as well as two 100-MHz Unix workstations for industrial uses, the Model 745i and Model 747i.

The Model 715/75 is priced at $15,395 for an entry-level configuration with 32M bytes of memory and a 525M-byte disk drive. The entry-level Model 725/75 is priced from $18,395, HP said.

The industrial Models 745i and 747i are priced at $22,890 and $26,490, respectively. Upgrades from installed 33-MHz Model 715 units to the 75-MHz version will cost users $10,500, while upgrades from the 50-MHz Model 715 or Model 725 to the 75-MHz version are priced at $6,500.

Groupware initiatives differ widely in style

By Michael Vizard

As the groupware phenomenon continues to evolve, the different tacks vendors are taking to address the growing demand for collaborative computing are beginning to emerge.

The dominant offering in this sector continues to be Notes from Lotus Development Corp. But Borland International, Inc. is promoting its recently unveiled Object Exchange (Obex) technology [CW, Sept. 20].

Notes allows Windows and Macintosh clients to access applications and documents stored in an object database running on OS/2, Unix or Windows servers.

Notes is generally recognized by users as particularly good at providing a foundation for the bidirectional communications needed to create interactive discussions. Lotus extends this metaphor to include tools for building tracking and process-oriented applications.

Open access to data

In contrast, Borland's Obex allows any application to share data by posting it in a separate object store that users can then subscribe to over any electronic-mail or network protocol. Essentially, Obex provides an application-independent mechanism for storing data that can then be inserted into other applications.

As such, it provides an unstructured method for dealing with data that is typically stored in structured documents such as databases and spreadsheets. In contrast, Notes provides a structured environment for documents that typically consist of unstructured data.

In general, Borland concedes that Notes is a good environment for electronic discussions but maintains that Obex is more useful for letting applications share data more cost-effectively. This is because Obex does not require users to adopt a specific database running on a server, as Notes does.

Lotus, however, stresses that the move to document-centric computing requires an object database that provides system services to manage and track access to documents.

OLE added

Meanwhile, Microsoft Corp. has said it is retooling Windows with a document-oriented interface and is adding system services — starting with its Object Linking and Embedding (OLE) interface — that were designed to ease data sharing and document tracking.

However, OLE currently works only on individual Windows systems. A network-aware version of OLE is not expected until the arrival of Microsoft's Cairo object-oriented operating system in 1995.

SQL Server users: Happy but hesitant

CONTINUED FROM PAGE 49

grocery chain's inventory and bookkeeping systems. The application can store up to two years' worth of data. The existing POS program kept just 13 weeks of material on-line.

"We can poll our records by many different variables, which helps us make smarter inventory decisions," Goodwin said.

Also attached to the system is a pen-based NCR UltraVersa portable computer. Managers stroll up and down store aisles with the UltraVersa, noting prices and checking bar codes. The machine can talk directly to a 486-based server over a wireless network.

Overall, NT and SQL Server for NT beta sites appreciated the help Microsoft gave them to create applications for the new products. But they said they plan to put those systems into production slowly, taking precautions. For example, King County Medical Blue Shield is running SQL Server for Windows NT only with applications that are simultaneously running on an IBM AS/400 minicomputer.

"This is the product's first release, so I'm not going to be blind and think nothing's going to happen," said Sean Dittmore, beta manager at the Seattle-based health maintenance organization.

To market, to market

To recoup a $170,000 outlay to build a Windows NT-based inventory/accounting system, Goodwin's & Sons plans to sell the program to other grocery chains. A 38-store New Zealand supermarket chain recently agreed to buy the product.

Geological Survey speeds up map production

By Gary H. Anthes
RESTON, VA.

The magic is in the digital orthophotos.

These are not computerized dental X-rays; they are a technological breakthrough in the way maps are made.

Work at the U.S. Geological Survey (USGS) is a little like the labors of Sisyphus, the mythical Greek figure condemned for all time to push a huge rock up a hill in Hades only to have it come rolling down again as it nears the top.

It took the USGS four decades to map the U.S. into 55,000 topographic quadrangles, each seven miles by nine miles on a side. As it takes years more to revise a map, most are out of date before they are printed.

But now, thanks to powerful workstations, geographic information systems (GIS) and digital orthophotos, the time needed to revise a map can be reduced by a factor of 10, while the resulting maps are retained in computer databases as well as on paper.

USGS is updating its old maps by scanning them from film and digitizing them, editing and annotating the resulting vector images with GIS-manipulable tags and codes and then overlaying them with recent aerial photographs fit precisely to the original map images by a mathematical process called "ortho-rectification."

Aerial photographs are scanned in and their digital images are precisely adjusted, pixel by pixel, for displacements caused by camera angle and terrain variations. Cartographers then sit at workstations and add, change and delete features in the map images based on what they see in the superimposed photo layer.

For example, cartographers can sketch in new roads, add houses, enlarge shopping centers or change forest boundaries with a mouse and a little help from the Arc/Info GIS package from Environmental Systems Research Institute, Inc. in Redlands, Calif.

Computing power to execute the equations needed to manipulate all those pixels was available only from mainframes, and that kept the process from being cost-effective, said Ernest B. Brunson, chief of the research, technology and applications branch at the Mapping Application Center.

Now, 200 cartographers at three locations on LANs do the job with Data General Corp.'s Aviion 530 workstations, Motorola, Inc.'s 88100 processors and 3G bytes of disk storage.

According to Eric Anderson, chief of the Mapping Application Center, it now takes a cartographer four to six weeks to update a map using the digitized map images and the computer-adjusted photographs instead of up to 18 months to do the work with paper maps and photographs.

However the method still has limitations, Anderson said. For example, ortho-rectification "flattens" the photograph so that it cannot be used to update map contours, which would be necessary to show how a new road cut through a mountain.

To do that, USGS employs stereoscopic pairs of aerial photographs that are superimposed over the digitized version of the old map. A cartographer wearing Polaroid glasses sees the terrain in three dimensions through a special Polarized screen — which gives him the impression of peering out of a hole in the bottom of an airplane — and he is able to adjust map contours accordingly using the Arc/Info software.

The new map update technology unfolding at USGS is really part of a two-pronged effort, with the first objective being to turn existing maps into computer-processable images tagged with identifiers for features such as roads, utility lines, rivers and buildings. That effort is about 10% complete, and the USGS hopes to have the entire database built by the year 2000, Anderson said.

Anderson said it costs the USGS about $10,000 to digitize and code each of the 88,5000 topographic maps.

A cartographer at the U.S. Geological Survey *updates a map using a GIS and digitized aerial photographs*

ON SITE

U.S. Geological Survey
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Challenge: To streamline a manual process for updating 88,500 topographic maps.

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Result: The most labor-intensive process was accelerated by a factor of 10.

Data General mulls Aviion microprocessor options

By Craig Stedman
WESTBORO, MASS.

With Motorola, Inc.'s 88000 RISC microprocessor facing an uncertain future, Data General Corp. has started doing test ports of its DG/UX Unix System V Release 4 derivative to other microprocessors. The company is trying to clear the path for a possible switch away from the 88000 as the engine for its Aviion servers in the future.

Stephen Gardner, DG vice president of Aviion marketing, would not specify which microprocessors are in line for test ports of the operating system. However, Gardner noted that DG is interested in "the most commodity-oriented ones," a category he said includes Intel Corp.'s Pentium and the IBM/Motorola PowerPC.

DG previously had said it remained staunchly behind the 88000, despite being one of just a handful of computer makers still using that chip as Motorola shifts its emphasis to PowerPC. Gardner reiterated that an immediate change is not in the offing but said DG is doing more involved "technology explorations" with other hardware architectures than it had previously.

"Sure, our level of activity has stepped up," he said. "But I think that's a logical thing to do given the new chip developments in the last 12 months. It's more driven by that than by concerns about the [88000]."

David Card, a Unix analyst at International Data Corp., a Framingham, Mass., market research firm, noted that even Motorola's own computer group has started telling users about plans for switching to PowerPC. "I think DG will have to make a statement fairly soon" on its migration plans, perhaps in the next six to 12 months, Card added.

DG expects to continue using the 88000 for "at least three or four years" and foresees both clock speed improvements and larger systems than the 16-processor AV 9500 scheduled to ship next spring, Gardner indicated. "There's no imperative for us to do anything" about the microprocessor, he said.

Gardner added, however, that the company's "crystal ball is subject to change." The test ports to the other architectures are intended in part to give DG "credibility with customers, to let them know that we're not deaf, dumb and blind" to the changes in the microprocessor market, he noted.

Rival vendors are using the uncertainty over the 88000 as a competitive weapon, and customers do bring the matter up, Gardner said. However, he described it as "a noise-level issue" given the portability of DG/UX, and several Aviion users agreed.

"From where I sit, it's no big deal," said Mitchell Stevelman, vice president of MIS at High Yield Management Securities, Inc., a brokerage firm in Clifton, N.J. For now, the 88000 provides better multiprocessor scaling than other architectures and more than enough raw performance, he added.

Stevelman is having no problem finding application software written to the 88000 and said he has been promised by DG that any switch to a new microprocessor will involve no more than a board swap and a DG/UX upgrade. "I expect it to be cake," he said.

Richard Duke, director of data services at St. Patrick Hospital in Missoula, Mont., also said he is unconcerned. "With their view of open architectures, we'll be able to make the jump," he said, adding that the portable nature of DG/UX was one of the main reasons the hospital bought Aviion machines.

Only about 7% of DG/UX's kernel code is hardware-dependent and would need to be changed to support another microprocessor, Gardner noted. He said DG does not want to settle on a new chip now "because today there's not one choice that looks like an obvious winner" in terms of microprocessor market share.

Briefs

System 3525 benchmarks

NCR Corp. announced benchmarking results for its System 3525 based on the Transaction Processing Performance Council's TPC-C benchmark. The NCR 3525, which was tested with two Intel Corp. Pentium processors running Informix Software, Inc.'s Online Database Server with NCR's Top End transaction processing monitor, performed at 666 transactions per minute (TPM-C) at a cost of $1,399 per TPM-C.

SHL, the ASK reseller

SHL Systemhouse, Inc. has agreed to resell database engines and development tools from The ASK Group, Inc. The deal is part of ASK's stepped-up campaign to sell more products through systems integrators.

Oracle adds to Financials

Oracle Corp. plans to add Datalogix International, Inc.'s Enterprise Manufacturing Management System to its Financials line. The Unix-based client/server manufacturing planning applications target process manufacturers.

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BUILDING A KNOWLEDGE NETWORK

"The pace of change in the nineties will make the eighties look like a picnic, a walk in the park."

Jack Welch
Chairman and CEO
General Electric
Fortune
March 26, 1990

What none of us realized in 1990 was that Jack Welch was guilty not of exaggeration but of understatement. It is not just the pace of change that is different, but the magnitude of the change. Success today depends on a company's ability to anticipate change, reduce product life cycles, adjust to changing government regulations, compete with companies in every corner of the globe, and transform ever increasing amounts of data into information that can be acted upon. It also depends on the ability of employees to learn to work in new and different ways.

"It is not just the pace of change that is different, but the magnitude..."

Today, businesses are downsizing and right-sizing, creating strategic alliances, and empowering their employees. They are tackling issues such as customer satisfaction and quality; they are reengineering their business processes; and they are striving to become more flexible by creating open learning organizations. The tool making all of this possible is technology.

The Great Enabler

Information technology speeds manufacturing and improves back office operations. Furthermore, the ability to tap into the vast amounts of information available provides that all-important competitive edge. For example, when a company shares information across the organization, layers of management can be eliminated, flattening the organizational structure. These flattened organizations can make—and implement—decisions quickly. Moreover, sharing information with customers and suppliers helps break down the organizational boundaries. When people share knowledge and work together, teamwork is enhanced, and when employees are empowered to deal directly with their customers, quality of service improves cementing relationships with customers.

Technology also provides information and tools that reduce costs and increase profit margins. It enables the reorganization, or reengineering, of business processes and functions. Moreover, technology eases the development of strategic alliances, whereby companies and their suppliers form long-term relationships, or companies join together to provide a wider range of services than any one of them can provide on its own.

But it is critical to remember that technology is not magic; it is a means of transferring and sharing information in an organization. After all, information shared, analyzed and acted upon is what provides the competitive advantage organizations need. The tools an organization employs for the management of technology, for bringing the right information to the right people, will determine whether or not information makes the order of magnitude difference organizations are seeking.

Applying Technology

End users need easy access to information, often in real time, to use it effectively. For example, a food and beverage company in the Midwest connected its information systems to its manufacturing systems to gain control of the flow of beer through its valves in response to information about sales, maximizing production capacity. A major clothing retailer restocks individual stores overnight because it can now transmit information gathered in a point-of-sale inventory control system to the central warehouse ordering system at the close of every business day, ensuring the availability of products in greatest demand.

Achieving these results is not simple. The development of information systems that fit organizational needs and can adapt to changes in the organization is a crucial issue. Selecting and implementing the right technology for the organization takes a thorough understanding of the nature of the business, its organi-

zational structure, its culture and the way management works. That is why those who assist organizations to choose their technological direction must look at the organization holistically. Optimizing functions and streamlining processes—reengineering—requires a thorough understanding of the processes, functions and technology in place.

For example, a top ten manufacturing company was able to reduce its performance measurements from 2000 individual measurements to 60 across the company through technology. A testing facility that thought it needed additional storage area to collect enough batches of specific products for future testing developed ways to optimize the testing process so that individual testing was cost effective, eliminating the need for storage. A company that custom builds homes can now present clients with screen images of the different possible configurations of rooms to choose from, eliminating the need for multiple individual blueprints, thus providing them with a competitive edge. One of Europe's largest banks now uses a parallel processing system to deliver the management information needed to service accounts within minutes, thus meeting its customers growing needs for sophisticated financial services.

Success today depends on transforming "data into information that can be acted upon."

These benefits are realized only when technology is used to maximize existing information to its fullest. But it is important to keep in mind that much of the information in an organization is not in the existing systems. Rather it is in the minds of employees. This information must be captured and incorporated into the organizational knowledge base.

Enhancing Knowledge

Capturing an organization's information and making it accessible to users across the company requires an investment of time and money. Not only must the right systems be put in place and the right applications chosen for accessing the information, but the organization's employees must learn to understand and use these new tools. The issues involved in providing the right technology are complex and often politically charged. For example, in today's new organizations information has to be closer to the individual user. This often means that central IT organizations are no longer the clearinghouse for all information systems, but rather provide guidance and standards while the line organizations or individual business units own the systems. In this computing environment, companies need help with issues of security and data integrity, they need help with the development of special applications that allow them to interface with their alliance partners, and they need tools that enable them to respond to customers in real time with critical information.

For example, to remain competitive a major bank needed executive support systems that facilitated portfolio management, a car designer needed a new design center that could speed delivery of new designs, and an aerospace company needed product data management. These tools could be developed for them because accumulated knowledge and experience across industries in numerous companies was available to ensure that all the latest developments in technology would be considered in choosing the right tools. The collective wisdom gained through the sharing of information makes a difference—and today that wisdom must be available in real time because of the speed of change.

CASE STUDY:

Price Waterhouse, a worldwide network of member firms, is one of the largest providers of professional services in the world, employing over 45,000 people. Long known as the premiere accounting/consulting firm, they conducted extensive client research and undertook a massive strategic planning effort in the late 1980s to solidify their competitive position in the coming decade.

Analyzing the many challenges that confronted those in their industry, they recognized valuable time was lost identifying the best people, based on prior experience and expertise, to staff client assignments; they knew how difficult it was to provide specific expertise about an evolving technology when they first had to locate that individual at Price Waterhouse; and they knew their clients would benefit tremendously if Price Waterhouse consultants working on an assignment in London could work in real time with people on the same assignment in New York.

Most of all, they realized their clients would be provided with added value, and their leadership position would be solidified, if they could find a way to give their clients access to the entire body of knowledge and experience of the firm while their competitors were providing advice based only on the experience of the people working on the assignment. After all, the principal product of a service firm is **knowledge**. Consultants provide advice to their clients; the greater the experience and expertise and the more timely the information, the more value they provide. The problem is that, in a world marked by constant change and an abundance of information, capturing and building on the expertise of such a large group of highly mo-

Price Waterhouse - Knowledge Fully Shared Solidifies Leadership Position

bile people presents an enormous challenge.

Price Waterhouse's leadership decided that to better serve their clients in the future, they had no choice but to collect the wisdom and experience that resided in the minds of their people and make it available to every member of the organizatioo. They began by looking at the problem holistically. First, they analyzed their own organization to better understand the nature of the problem they faced:

- The enormous size of the organization (over 45,000 people) and the number of locations across the world (400 offices and 100 countries).
- The fact that as consultants, their professionals spend a great deal of time traveling and workiog at elient sites.
- Their constant need for ioformation—on various industries, regulations, economie and demographic factors, and technological developments—that becomes obsolete almost as soon as it is available.
- The oecessity of assembliog teams from many geographical areas to work on specific projects io many different locations.
- The importance of providing both staff and elients with information about technological developments from external sources on a need-to-know basis.
- The fact that Price Waterhouse has its own R&D laboratories (Technology Centre and Advanced Software Engioeeriog Centers) that both needs informatioo and has highly technical information to eonvey to those working on projects.
- The need to document information so that, for example, when a project is completed or an individual leaves the firm, the information gained is not lost.

Price Waterhouse turned to technology for an answer. After a great deal of experimentation, it built a proprietary system that allowed it to collect and analyze data, to store information, to access outside information sources, and to tie together the whole global organization. Furthermore, Price Waterhouse did not limit its use, but is sharing information with strategic alliances and suppliers as well as elients. It also spent a great deal of time changing the culture of the organization, instilling an appreciation of the value of flexibility and open communication in all those who are a part of the organization. Today, all Price Waterhouse staff are linked together on a network that provides vast amounts of information in real time, a network that allows staff members to work together though far apart, a network that captures all the information generated in the course of an engagement to provide a base for those involved in the next project to build on.

Today, a Price Waterhouse partner in Paris, one in Argentina, and one io California can work on an assignment together, without wasting valuable time and money traveliog to the same location; the teamwork encouraged by this interactive system provides the enhanced productivity once achieved by physical proximity. Today, a Price Waterhouse partner can find someone with specifie experience in a new technology for a project in hours by searching a data base of all employees; time wasted making oumerous phone calls has been eliminated. Today, all Price Waterhouse people can remain on the leading edge by sharing research findings on a real time basis from their technology labs around the world; they no longer have to do the research themselves. Today, an institutional memory exists, allowing Price Waterhouse professionals to examine previous engagements and learn by their findings; they no longer have to reinvent the wheel. Today, Price Waterhouse tax partners in all fifty states can provide elients with information overnight about the effects of a ehange from a tax law passed yesterday; copies of the legislation can be scanned into the system immediately upon passage, a note can be sent out announcing a conference call to discuss it a few hours later, and the collective opinion of the Price Waterhouse experts can be sent out on the system in hours. Today, a team of Priee Waterhouse consultants out on assignment can call into the network through their laptops and access all the resources they would have available if they were in their own offices; they can request information and materials, access presentations on technical or business issues, and set up new travel plans from their homes and hotel rooms, responding to changing client needs. Today, a Price Waterhouse partner can tap the entire firm for ioformation io response to a elient's question and provide an answer based on knowledge fully shared—the world is at their fingertips.

Price Waterhouse has successfully entered the age of information through the use of advanced technology, and is well positioned to help its elients do the same. In order to learn how Priee Waterhouse can draw on its own experience to help you reach your full potential through informatioo technology write: James Rafferty, Price Waterhouse, Management Consultiog Services, 1251 Avenue of the Americas, New York, NY 10020 or call (212) 819-5000.

Price Waterhouse gives clients "access to the entire body of knowledge and experience of the firm." Their competitors provide "advice based only on the experience of the people working on the assignment."

Price Waterhouse

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Start-up to market Windows NT server with Microsoft

By Jean S. Bozman
SUNNYVALE, CALIF.

Netpower, Inc., a start-up funded by Silicon Graphics, Inc. (SGI), Stanford University and venture capitalists, is scheduled to announce today that it is shipping a Microsoft Corp. Windows NT server based on RISC chips.

The Netpower server family is one of the first groups of machines to support Windows NT applications in direct competition with RISC-based Unix workstations and servers, the company said. The servers are built with RISC chips provided by SGI subsidiary Mips Technologies, Inc.

Netpower will jointly market client and server versions of the computer with Microsoft, said Linda Hargrove, Netpower vice president of marketing. Microsoft has been involved with a precursor to the Netpower machine for some time, Hargrove said.

Microsoft was one of 20 beta sites for the server, she said. Others include Fidelity Investments in Boston and Nordstrom, Inc.'s department store chain in Seattle, Hargrove noted. Now, 9-month-old Netpower will join with Microsoft in regional sales events, she said.

Marketing will initially be aimed at users in the Windows NT software development community and in the computer-aided design market, said technology analyst Jeffry Canin at Salomon Brothers, Inc. in San Francisco.

Over time, the small firm can expect competition from two sides: Intel Corp.-based PCs, especially Pentium models, and Unix workstations, Canin said. However, Netpower's small size — reportedly less than 100 staffers — will allow for a PC business model that depends more on retail and channel sales than on direct sales.

Runs 32-bit applications

At the heart of the Netpower machine is a Mips R4400 RISC chip operating at either 50 MHz, 67 MHz or 75 MHz. It is a chip with a 64-bit internal address space that runs 32-bit applications, said Ed Frank, vice president of research and development, who helped design Sun Microsystems Inc.'s SPARCstation 10 Unix workstation. Prices range from $4,995 for the desktop Model 100 to $17,000 for the high-end Model 300 server; all models will ship immediately.

Frank claimed the price/performance of the Netpower NT system is better than many midrange Unix workstations, performing as well or faster at a lower price.

Interoperability with Unix applications will play a key role in the Netpower strategy. "We're working to be able to use our machines as X Window servers to a Unix application," Frank said, so that users can have both NT and Unix software on the same screen.

The next generation of Netpower servers will also support Sun's Network File System, allowing the NT and Unix servers to exchange files, he said. The machines will also run on TCP/IP open systems networks and can act as clients to a Novell, Inc. NetWare server.

Netpower's entry in the NT market will complement SGI's Unix strategy, said C. Robert Miller, chief executive officer of Netpower. "SGI thinks it's very important for the Mips [chip] architecture to succeed in the NT space," said Miller, who was CEO at Mips Computer Systems, Inc. when it was acquired by SGI. "From their perspective, it's a totally different business model [than the one] they're operating with today, where they're using Unix to address the high-end scientific market."

Miller did not disclose the size of Netpower or project its revenue for the coming year.

Woodside Technologies, Inc. has introduced Version 3.0 of its Fortress Unix Security System Software.

Version 3.0 offers a "directory tree" database editor, security checks and support for the Opeo Software Foundation's Motif and Sun Microsystems, Inc.'s OpenLook graphical user interfaces.

File-status and inoculation data are now stored in Data Encryption Standard-encrypted "protected files databases" to deter hackers, according to the Sunnyvale, Calif., firm.

The product is available for Sun's SPARCstations using the SunOS 4.1 operating system and for IBM's RS/6000s running AIX 3.2.

Fortress is priced at $495 to $795 per copy.

▶ *Woodside Technologies*
(408) 733-9503

Introl Corp. has announced FlexStor, distributed Hierarchical Storage Management software for Sun Microsystems, Inc. environments.

The product automatically monitors all data on the system and migrates files based on the setup criteria. Migration can be determined by the size, age, date, group or location of a file or by other user-defined parameters.

Noncritical files are relocated from on-line network disks to a less expensive storage level in the hierarchy.

According to the Minneapolis company, transparent migration between on-line disks is supported, as well as near-line optical discs or tape libraries and off-line tape libraries. For maximum performance, on-line disks are dynamically optimized.

Prices start under $4,000.

▶ *Introl*
(612) 788-9391

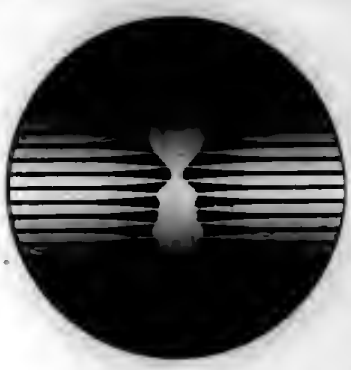
Artisoft, Inc. has announced the LANtastic Interchange software, a product that provides bridging and routing capabilities for LANtastic LAN Version 5.0 users.

According to the Tucson, Ariz., firm, the LANtastic Interchange software will link LANtastic networks that run over dissimilar hardware, cabling and topologies including Arcnet, Ethernet and Token Ring.

The product also has the ability to route data packets between networks, transporting each packet to the correct network segment along the quickest and most efficient path, which improves performance and reduces traffic. A statistics feature will let administrators monitor network traffic.

The software is priced at $199 per segment.

▶ *Artisoft*
(602) 670-7100



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Memory ☐4MB ☐8MB ☐16MB ☐32MB ☐64MB

Hard disk ☐170MB ☐240MB ☐340MB ☐440MB

EISA DESKTOP (8x6)

Processor ☐486DX2, 66 MHz ☐Pentium, 60 MHz

Memory ☐8MB ☐16MB ☐32MB ☐64MB

Hard disk ☐170MB ☐240MB ☐340MB ☐440MB ☐540MB SCSI-2*

EISA TOWER (8x12)

Processor ☐486DX2, 66 MHz ☐Pentium, 60 MHz

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Hard disk ☐170MB ☐240MB ☐340MB ☐440MB ☐540MB SCSI-2

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3Com gets house in order

By Elisabeth Horwitt
SANTA CLARA, CALIF.

3Com Corp. moved to put its network management house in order recently when it announced Transcend, a set of applications for managing 3Com's range of hubs, routers and network adapters.

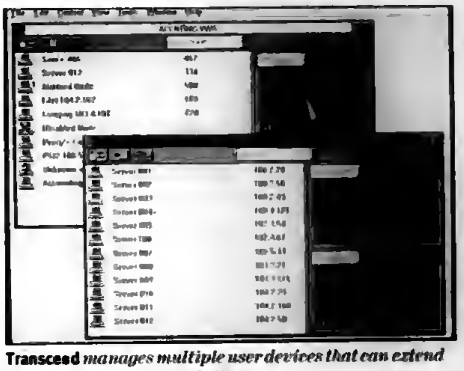
The applications run on a Windows-based console or the leading Simple Network Management Protocol (SNMP)-based enterprise network management systems, the vendor said.

3Com's delivery of such a system in a timely manner is crucial if it is to compete against its key rivals in the hub arena, Cabletron Systems, Inc. and SynOptics Communications, Inc., said Val Sribar, senior research analyst at Meta Group, Inc. in Westport, Conn.

"Before, [3Com] had a very fragmented management strategy, principally because they had acquired a lot of products," he said.

During the past year or so, 3Com acquired BICC Data Networks with its Ethernet hubs and Star Tek, Inc. with its Token Ring hubs to complement its own line of bridges, routers and LAN adapters, wreaking havoc with a consolidated management approach.

By contrast, Cabletron and SynOptics have been shipping for a year or more their platforms for managing both their own hubs and other SNMP-compatible devices. These vendors are also offering their management systems as applications on a growing number of leading management platforms, such as Hewlett-Packard Co.'s OpenView and IBM's NetView/6000, Sribar said.



Transcend *manages multiple user devices that can extend across multiple hubs and sites*

This is a key feature because it enables users to monitor their hubs from the same enterprise management platform that monitors their routers, adapters and networked systems via SNMP, he said.

While acknowledging that 3Com's network management strategy was "an area of weakness" until now, company spokesman Raj Dhingra claimed that the company has leapfrogged its competitors with Transcend.

Agent in residence

Transcend is an object-oriented system that provides users with the ability to manage "logically related network devices as a single entity" through SmartAgent software that resides on 3Com hubs, routers and bridges, Dhingra said. While SynOptics and Cabletron have centered their network management strategies around their hubs, 3Com SmartAgents give users the option of installing network management intel-

3Com, *page 73*

Digital networks

Consortium paves way for 'data superhighway'

By Gary H. Anthes
WASHINGTON, D.C.

Seventeen U.S. computer and communications companies, universities and government agencies recently formed a consortium to build high-performance data networks and computer applications intended to prepare the way for the Clinton administration's proposed "data superhighway."

As its first project, the National Information Infrastructure Testbed (NIIT) will set up a high-speed digital network linking environmental scientists at nine sites in a "multimedia workgroup application" called Earth Data System. The scientists will share computational resources and earth imagery and other data as if they were working side-by-side.

The consortium said its goal is to integrate existing technologies in distributed computing and advanced communications to implement a number of real-world applications. The efforts will complement the network research test beds being developed by the Corporation for National Research Initiatives and others under

Consortium, *page 68*

Mobile trends bring higher telecom costs

By Joanie M. Wexler

■ Integrated Services Digital Network (ISDN) technology could play a significant role in the life of the mobile and telecommuting business worker, depending on the degree of coverage the networks eventually gain.

In fact, Forrester Research, Inc., a Cambridge, Mass., consultancy, predicted in a recent report that ISDN will become the dial-up networking method of choice for mobile users and small offices by 1995. The main reason is that modems do not deliver the same speed and trouble-free operation users are accustomed to with LAN-based computing, Forrester Research analyst Jay Batson said.

Addressing this potential trend, which would result in beefed-up corporate telecommunications activity, some vendors have recently started shipping products that help companies manage their wide-area network line costs. DigiBoard in Eden Prairie, Minn., for one, delivered software earlier this month that automatically sets up and tears down ISDN connections to Novell, Inc. LANs whenever appropriate.

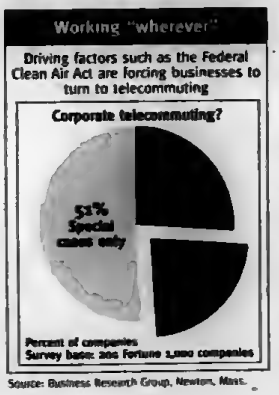
Meanwhile, competitor Combinet, Inc. in Sunnyvale, Calif., shipped a single-user hardware/software product that works with additional types of wide-area links as well as upper-layer LAN protocols.

No need to log off

Such products relieve companies from having to rely on users to conserve costs. Remote users, accustomed in the LAN world to what they consider "free" bandwidth, tend to set up a call, then leave the connection open rather than logging off and initiating new sessions when they start work again, said Julie Thometz, DigiBoard's marketing manager of telecommunications.

Meanwhile, their companies pay for unused connections, which can run into multiple hours.

"In a university environment, people tend to log in and stay logged in until they go home," agreed Peter Olenick, manager of network systems at Princeton University's Computer and Information Technologies Group, a DigiBoard shop.



Source: Business Research Group, Newton, Mass.

To conserve ISDN line charges — which consultancy TeleChoice, Inc. in Verona, N.J., said can cost up to 20 cents per minute for the use of just one of Basic Rate ISDN's two 64K bit/sec. channels — DigiBoard created the $995 PC IMAC for NetWare Systems.

The product's software component is a NetWare Loadable Module for Novell servers that works with DigiBoard's PC ISDN network interface card.

However, "the question is, how does a piece of computer equipment know there isn't any work being done?" Olenick said. "And if I destroy the link because it's idle, do I lose any [unsaved] changes?"

According to Thometz, the software can distinguish between user data and Novell administrative packets, which in older versions of NetWare's IPX protocols are broadcast periodically throughout the network to ensure that connections are still humming. If the software sees only administrative packets for a particular length of time determined by the customer, it automatically disconnects the session.

Broad compatibility

Combinet's $900 version of its Everywhere bridge line plugs into any personal computing device with an Ethernet connection, including laptops, and manages not only ISDN but also switched 56K bit/sec. and dedicated telecommunications connections, according to Bob Downs, vice president of business development.

The Everywhere line is not specific to upper-layer communications protocols; its generic filtering feature allows users to select what kinds of packets they want to control, Downs said.

TeleChoice President Daniel Briere said that videoconferencing is likely to be a growing application for products such as those delivered by DigiBoard and Combinet.

"People turn off the monitor and think they've turned off the link," Briere said. Little do they know the clock just keeps running, he added.

Novell revs up remote MHS

Service allows greater access to NetWare messaging

By Lynda Radosevich

A number of recent developments could make life a little easier for users trying to get their messages and message-enabled work-flow documents from Novell, Inc.'s NetWare networks while on the road or in a remote office.

"Work flow does not discontinue when you walk out the door, and the remote issues of connecting and having the work flow go back to the enterprise are an important part of the process that most people forget," said Priscilla Emery, a vice president at consulting company New Science Associates, Inc. in Westport, Conn.

To help managers with remote messaging, Novell last week announced an updated version of its Message Handling Service (MHS). The remote software is aimed at people using portable computers at their desktop and on the road. It lets those users access NetWare's messaging service with the same interface for either modem-based asynchronous connections or direct network connections.

Some assembly required

To use Remote MHS, companies must have Global MHS, a Novell NetWare Loadable Module that adds store-and-forward messaging functions to LANs running the NetWare operating system. When connected through a network adapter, remote users operate just like network users, but their personal mailboxes are stored on their local drive instead of on the server, according to Novell.

Novell said that Remote MHS will be available by early next month, and that drivers for the wireless RAM Mobile Data Network will be available for free shortly after the product ships.

While the Novell MHS software takes care of the "back-end" communications part of the remote messaging equation, applications vendors are stepping forward with client or "front-end" software.

For instance, Da Vinci Systems, Inc. in Raleigh, N.C., said it plans to ship on Dec. 15 a version of its electronic-mail software for Remote MHS 2.0. The updated software is integrated with Novell's Remote MHS to allow a simultaneous installation and single-point administration using the DaVinci interface.

Users will have more than one choice of client software for Remote MHS.

Pricing has not yet been set. The current version is priced at $299 for a DOS/Windows version.

Decisions, decisions

Users will have more than one choice of client software for Remote MHS. Beyond, Inc. in Burlington, Mass., said that its BeyondMail E-mail software for DOS and Windows will operate with Novell's remote back end. Beyond is targeting customers using the work-flow and routing features of BeyondMail.

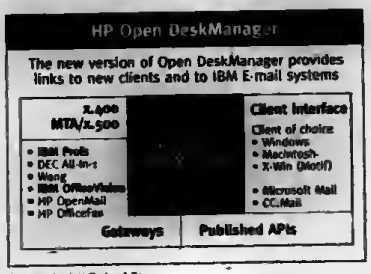
For example, a remote sales representative can request updates to a local product pricing database by creating a form in BeyondMail and sending it to a pricing mailbox at the main office. Beyond's remote software will be available in November for $295.

HP updates E-mail

By Lynda Radosevich
SAN FRANCISCO

Hewlett-Packard Co. announced several enhancements to its electronic messaging software for its proprietary HP 3000 minicomputer at the Interex '93 user conference here last week.

The Open DeskManager E-mail system, which HP claims has 1.5 million end users worldwide, will directly link Lotus Development Corp.'s CC:Mail and Microsoft Corp.'s Mail clients. That means that CC:Mail and Microsoft Mail users can exchange messages and share directory services with Open DeskManager users without using gateways. Also, managers can centrally administer the directories and gateways to other systems.



Source: Hewlett-Packard Co.

In addition, Open DeskManager's support for Lotus' and Microsoft's Messaging Application Programming Interfaces (MAPI) will allow groupware software written to those MAPIs to operate using the Open DeskManager.

"LAN-based E-mail systems today have a limited number of people that each post office can support. If you look at organizations with a few thousand people, you have several hundred post offices," said Steve Glagow, director of the electronic-mail service at BIS Strategic Decisions in Norwell, Mass.

The HP Open DeskManager has one post office and one place to manage the mail systems, and users have the choice of Microsoft Mail, CC:Mail or the HP interface. However, because of its proprietary base, the product aims to maintain the current HP Open DeskManager users and to show that HP is still committed to the product, Glagow said.

HP has a similar E-mail product, called HP OpenMail, for its Unix-based servers. HP said that gateways between Open DeskManager and IBM's Professional Office System are available.

Data superhighway

CONTINUED FROM PAGE 67

the sponsorship of the National Science Foundation.

The consortium's work may also address criticism that the federal government's High Performance Computing and Communications program is long on leading-edge research but short on delivery of real applications to serve broad segments of society.

Membership in the NIIT is open to any organization for a small membership fee. William Murphy, chairman of the NIIT steering committee and director of global accounts at Hewlett-Packard Co., said it is impossible to estimate the total contribution of members, with large firms applying the results of investments in the hundreds of millions of dollars.

Murphy said the NIIT is intended to prove out advanced — but existing — technology "and go to market with real live products."

Earth Data System users will be environmental scientists across the U.S. accessing gigabytes of data — for example, detailed satellite imagery of Brazilian rain forests — from remote servers. "The idea is being able to access huge amounts of information in real time in a place you want it to be," Murphy said.

"Also, the scientists may not know what data is available, so this will allow them to collaboratively browse through distributed databases to find out what is available, and then download it at 45M bit/sec.," he added.

Murphy said the intent is to give users tools that allow applications to be distributed, not just high-bandwidth pipes. "It's like we are building a test freeway. The freeway itself is already built, but there are no on-ramps, off-ramps, road signs, hotels, restaurants or gas stations, and there aren't even many vehicles to run on it yet."

Earth Data System is due to be operational in November. The following companies are involved in setting up the NIIT:

- **AT&T** will provide campus-area frame-relay networks at several sites, as well as network monitoring tools and high-speed routers as gateways between the frame-relay networks and LANs.
- **Sprint Corp.** will provide nationwide Asynchronous Transfer Mode (ATM) switching services to enable geographically dispersed sites to act as if they are part of one local group.
- **HP** will contribute workstations, servers and networking equipment and distributed computing expertise.
- **Network Systems Corp.** will supply high-speed routers to connect the ATM network and the LANs.
- **Oregon State University's College of Oceanic and Atmospheric Sciences** will contribute environmental data and research expertise for the application.
- **Sandia National Laboratories** will contribute expertise in geographically distributed computing, massively parallel computing, networking and information security.
- **Smithsonian Astrophysical Observatory** will help design and manage development of the application.
- **University of New Hampshire's Earth, Ocean and Space Institute** will contribute data, research expertise and application design.
- **Ellery Systems, Inc.** will supply systems engineering and application software.

Next year, the NIIT will bring up a health care application that will computerize patient records. NIIT said it will later work on applications in education, access to public records, manufacturing and financial services.

Adding to consortium lineup...

The same day the NIIT revealed its plans, Vice President Al Gore unveiled the administration's policy outline for the National Information Infrastructure (NII), a high-performance internet serving users in manufacturing, education, health care and science research.

Gore said the infrastructure will be built by the private sector, with modest government funding — $1 billion to $2 billion a year — for research, tests and standards setting. "The government should steer and not row," he said, adding that the administration will seek legislation to increase competition in the telecommunications industry.

Gore said the administration will establish an interagency Information Infrastructure Task Force and a private sector council to advise the government on data highways.

"The administration's action agenda sends a clear signal that the further development of the NII is their top technology priority," said James Unruh, chairman and chief executive officer of Unisys Corp. and chairman of the Computer Systems Policy Project. —*Gary H. Anthes*

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Typical Usage	Departmental network services—primarily NetWare	Departmental network application services—NetWare, NT and Unix	Application services for preemptive downsizing—NT and Unix
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Fault Recovery	Standard rapid recovery services automatically return server to full operational status even in the event of a critical subsystem failure		
SIMPLICITY, EASE OF OWNERSHIP AND SUPPORT			
SmartStart	Standard CD-based intelligent hardware configuration and system software installation, providing simplified server configuration for NetWare, NT or Unix. (CD-ROM drive standard)		
System Warranty	Free Three-Year, On-Site Limited Warranty		
Pre-Failure Warranty	Three-Year, On-Site Warranty replacement of designated components that fall below preestablished thresholds		
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3Com

CONTINUED FROM PAGE 67

ligence across the range of 3Com devices.

For example, a small site that does not have enough users to cost-justify installing a hub can use a 3Com router with SmartAgent to collect information about LAN devices and ship it to a central management system. A SmartAgent installed in a network adapter can act as a domain manager for a group of PCs.

In addition, 3Com provides a Novell, Inc. NetWare Loadable Module proxy agent that can monitor NetWare installations, Dhingra said.

Transcend also runs as an application on Novell's NetWare Management System as a way of integrating management of 3Com products with NetWare and other SNMP-compatible devices.

Support for other network operating systems is in the works, 3Com said.

Transcend manages multiple user devices as a "logical network" — also known as a "virtual workgroup" — that can extend across multiple hubs and sites, the vendor said. For example, the administrator can define a user workgroup that includes all devices on one hub, plus a couple of users who happen to reside on a LAN in another building, Dhingra said.

The management application can then track traffic and error levels for that user group as a whole, rather than having to track each LAN as a separate physical entity.

But "virtual workgroup definition is a Pandora's box which has limited value with most approaches," Sribar said. He noted this is because of the difficulty of "pulling out management data" from routers and other devices that are being used by different virtual workgroups.

Transcending options

Transcend is available today as an application on the SunNet Manager platform from Sun Microsystems, Inc.'s SunConnect business unit. It also comes in the form of OS/2-based SmartAgents for hubs, routers and manageable adapters.

LinkBuilder FMS Manager, a Windows-based application for managing 3Com devices, is also available today. A Transcend application for HP's OpenView is due out by year's end; an application for IBM's NetView/6000, Novell's NetWare Management System and Microsoft Corp.'s Windows NT platforms is due to ship next year.

Also in 1994, 3Com plans to ship Transcend connectivity applications for campuses, buildings, remote offices and wide-area network backbones.

3Com is also shipping NetBuilder II, a family of solid-state flash memory products that are said to implement Transcend SmartAgents in the vendor's line of NetBuilder II bridge/routers.

The agents monitor traffic and error levels on 3Com hubs using Remote Network Monitoring and SNMP. A new autodiscovery feature automatically discovers bridge/routers.

Pricing for the NetBuilder software ranges from $350 to $2,000, depending on the features provided and platform. 3Com also announced a Windows-based Transcend application for managing its LinkBuilder stackable hub, priced at $495.

—Elisabeth Horwitt

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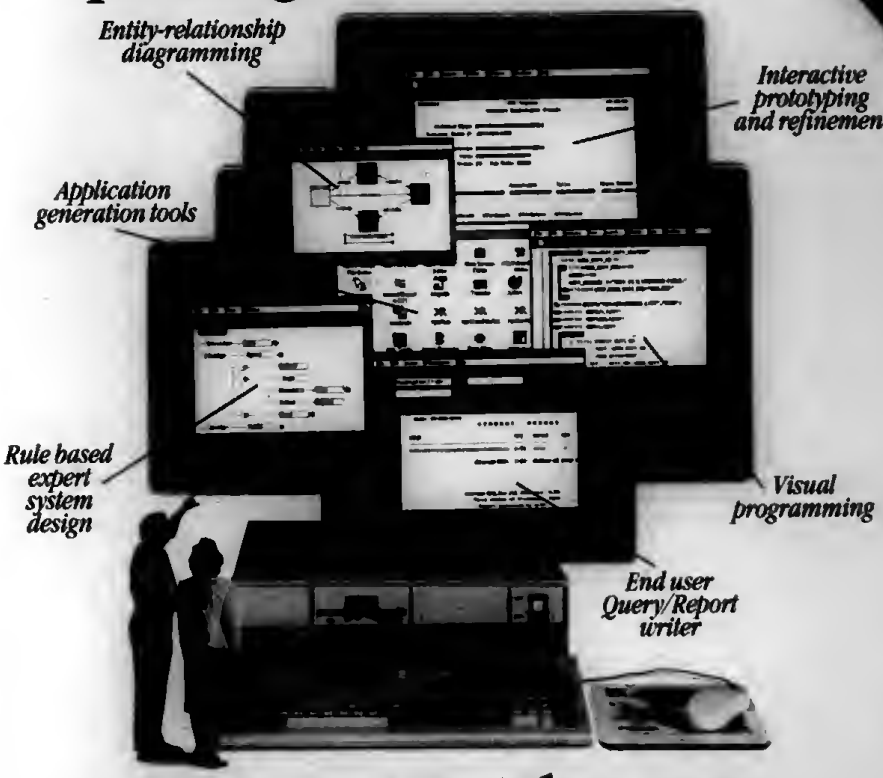

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'Everyman' videoconferencing services emerge

By Joanie M. Wexler
VENTURA, CALIF

Though a century ago it was a technical wonder, the telephone has long been status quo on every corporate desktop. And in just a decade or so, the working world has quickly come to expect a fax machine in every office.

Next up on the taken-for-granted list could be commercial videoconferencing services in every neighborhood.

Nationwide retailer Kinko's Service Corp., teaming up with telecommunications company Sprint Corp., said recently it is building a commercial T1 (1.5M bit/sec.) videoconferencing and data network. The idea is to allow businesspeople and consumers to dial up full-motion video meetings in Kinko's stores across the country.

Standards at work

Because of video compression standards spanning multiple vendors' equipment, customers will be able to connect not only with other Kinko's stores but also with 3,000 public and private videoconferencing rooms in 38 countries.

Kinko's, known for its desktop publishing and photocopying services, said its goal is to offer the services in 100 Kinko's locations by April and to have all 600-plus Kinko's stores outfitted with Picturetel Corp. desktop and low-end room systems in about two years.

The birth of retail videoconferencing services would represent another option in the corporate user's bag of networking tricks, business users and analysts said. For example, some said dropping into the local Kinko's for a meeting instead of continually traveling could help them use their time more efficiently and would complement the mobile nature of the emerging "virtual corporation."

Kinko's videoconferencing customers *can tune into bosses, business partners or Grandma*

"My gut feeling is that this has definite implications for me as a sales tool," said Michael Costantini, a product manager at Ingersoll-Rand Co.'s Process Equipment Division in Nashua, N.H., a Kinko's customer.

Costantini handles all the sales activity at the division. He said he is excited about the new avenue for meeting with existing and potential customers because it could free up time usually wasted in transit for more sales calls. Also, he said, he could afford to communicate more regularly with a key business partner in Japan.

To use the service, users set up a video link by dialing an 800 number; they can communicate with someone in another Kinko's store or in a public or private videoconferencing room somewhere else.

Kinko's has not yet nailed down pricing — or the initial implementation sites — but said it expects the regular hourly rate to be about $150.

When offered at regular rates, though, the service will not initially be priced for the average consumer, said Sarah Dickinson, an analyst at Personal Technology Research, Inc., a market research firm and consultancy in Waltham, Mass. She said that rather than running only high-quality videoconferences at 384K bit/sec., the company should consider 112K or 128K bit/sec. services to bring the price down.

"At least, consumers will probably want a choice" for a lower-quality link that is less expensive, she said.

On the corporate side, Costantini said he has determined that an average in-person sales call costs $150 to $250, "so Kinko's services would have to compete with that."

While Kinko's partner, Sprint, offers its own "drop-in" videoconferencing service, called the Meeting Channel, Sprint spokesman Norman Black said it uses higher-end gear and houses multiple monitors and cameras to accommodate large meetings.

By contrast, Kinko's, at least initially, would be providing smaller-scale and less expensive services. Also, Sprint's Meeting Channel coverage is narrower, with rooms in 65 locations across the country, compared with Kinko's goal of hundreds of store locations, Black said.

Network General offers long-awaited Rmon

By Elisabeth Horwitt
MENLO PARK, CALIF

As a concession to users wanting lower-cost, standards-based LAN diagnostics and monitoring, Network General Corp. last week announced its long-awaited support of the Remote Network Monitoring (Rmon) standard.

Network General's most basic answer to that need is an Rmon PC agent, priced at $2,995, that sits on an 1960-based PC board and monitors a given LAN segment. The agent can collect statistics from all nine Rmon groups, which include traffic and error analysis.

At that point, the agent sends the raw data to any network management platform to allow users to capture, display and analyze the information, said Pam Larese, Network General product manager.

The vendor also announced an Rmon version of its Distributed Sniffer Server product. Rmon information is first sent to the Sniffer central console, running on a Sun Microsystems, Inc. SPARCstation, which monitors multiple LAN subsegments in real time using a graphical user interface, Larese said.

The console can then send the data to the Rmon Sniffer Server, which translates the Rmon data into a format that can be processed by the Expert Sniffer software packaged with the Rmon server. The expert system program automatically analyzes incoming information, correlates it, figures out the most likely cause of a problem and guides the user through the process.

However, these features come at a cost. Each Rmon Sniffer Server starts at $9,495, including hardware that runs on a nondedicated 286 PC. In addition, users need the Sun SPARCstation console and software to act as a collection and display point, as well as the Rmon agents.

Network General can get away with high-end pricing because "no one beats them at decoding and analysis," said Val Sribar, senior research analyst at Meta Group, Inc., a Westport, Conn., research firm. However, Network General needs to catch up with LAN diagnostic software vendors that are busily teaming up with leading network device vendors such as Cabletron Systems, Inc. and SynOptics Communications, Inc., Sribar said.

Sniffer options

Network General is adding Rmon capabilities; several levels of functionality are available

Rmon PC agent	Expert Sniffer Server	Rmon Sniffer Server
• Lower cost per segment • Supports all nine groups • High performance rate • Fits into any x86++ PC (nondedicated) • $2,995	• Digital Analysis • [illegible] • $9,495 to $9,495	• Simultaneous Rmon and Expert Analysis • $9,495

Source: Network General Corp., Menlo Park, Calif.

The fruits of these alliances will be hubs and routers that monitor and diagnose their own LAN segments, Sribar said. Hewlett-Packard Co. is working toward this with its recent acquisition, Metrix Network Systems, Inc., whose diagnostic software runs across a variety of platforms, including SynOptics hubs, Sribar said. In the works is an HP application on OpenView that will collect and correlate data coming in from both Metrix's and HP's LAN diagnostic products, Sribar said.

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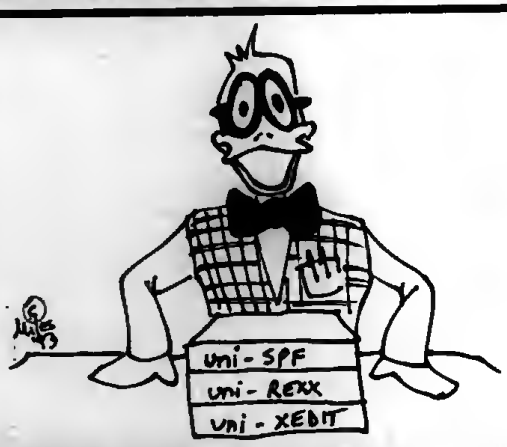

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“Micro Focus is helping us to rightsize development, and our customers to rightsize their applications.”

Mike Keesee, Vice President

American Software is an Atlanta-based software vendor, marketing solutions for the distribution, utilities and manufacturing industries. Established twenty years ago, it has grown rapidly to its position today as a $100m, 950-employee organization.

As Vice-President responsible for Planning Systems, the company's best known product line, Mike Keesee believes that responsiveness to customer needs is key to American Software's success. With the company targeting its solutions in the DOS, UNIX® and OS/2® environments, flexibility is fundamental

"We selected Micro Focus early on as the tool of choice. We're a COBOL company and Micro Focus offered the ability to move from the mainframe environment to the PC environment swiftly, leveraging the expertise that we already had in-house," says Keesee.

The reaction at American Software to now working on the PC, Keesee points out, is very positive. "The developers will never go back to mainframe development again. No one here wants to return to mainframe development once they've had a taste of developing with Micro Focus Workbench.""

"The Micro Focus Downsizing Solution is one of the cornerstones of that very strategy. It provides us with a flexible, cost effective means of leveraging existing COBOL skills and tools to develop new products quickly."

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GSA Contract Number GS00K93AGS6403.

[redacted]

Xyplex, Inc. has announced the 301 Port Switching Token Ring concentrator for the Network 9000 Routing Hub.

The product provides 12 RJ-45 Token Ring ports that support unshielded or shielded twisted-pair cabling and can operate at either 4M or 16M bit/sec., according to the Boxboro, Mass., company.

The concentrator offers dynamic error detection and two automatic ring wrap features.

The product costs $1,995.

▶ *Xyplex*
(508) 264-9900

Crescendo Communications, Inc. and **Hewlett-Packard Co.** have introduced 32-bit Extended Industry Standard Architecture (EISA) adapters that support HP Apollo 9000 Series 700 workstations using Fiber Distributed Data Interface (FDDI) over shielded and unshielded twisted-pair and fiber-optic cable.

The EISA-HP adapters provide 100M bit/sec. connections for an HP workstation to an FDDI or Copper Distributed Data Interface (CDDI) concentrator, according to Crescendo in Sunnyvale, Calif.

The product line includes the C320-HP CDDI EISA adapter, C321M-HP FDDI adapter and the C316M FDDI EISA and C325 CDDI EISA dual-attach options.

Prices range from $695 to $1,995.

▶ *Crescendo Communications*
(408) 732-4400

Linkon Corp. has introduced FaxPeak, an interactive voice response communications board with speech recognition and fax capabilities for Unix computers.

FaxPeak enables an organization to automate the delivery of information to its customers through a number of services ranging from fax broadcasting to fax-on-demand, according to the New York company.

Using one slot on a computer, FaxPeak can fax data and receive voice on up to eight different ports simultaneously.

The product also includes Linkon's LinkEngine multimedia communications board, fax and voice software.

FaxPeak is available for $2,995 for four channels and $4,995 for eight channels.

▶ *Linkon*
(212) 753-2544

Thomas-Conrad Corp. has announced the Sectra Network Management System, a report-oriented, Windows-based platform for network management.

According to the Austin, Texas, firm, Sectra was designed to accommodate multiple protocols and segments, exponentially increasing management needs.

The Sectra wiring hub supports Token Ring, Ethernet and Fiber Distributed Data Interface protocols. The company announced plans to provide a growth path to Fast Ethernet, Asynchronous Transfer Mode and other protocols as they appear.

The product is priced at under $5,000.

▶ *Thomas-Conrad*
(512) 836-1935

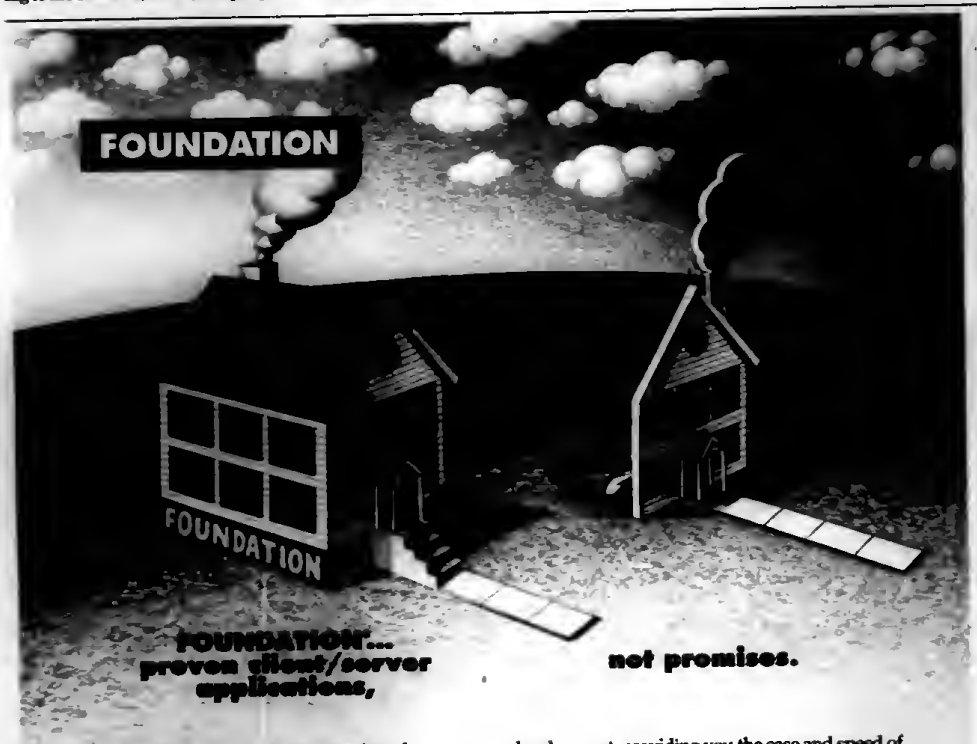
Siren Software Corp. has introduced Siren Mail, an Internet electronic-mail and fax communications center for open systems platforms.

The product offers the Open Software Foundation's Motif- and Windows-based character interfaces and uses standard TCP/IP and Unix mail transports, RFC822/MIME Internet protocols and fax servers to send mail messages and documents.

Siren Mail includes a built-in message editor that automatically formats the text of a message as a user enters it, according to the Menlo Park, Calif., firm.

A single-user license of Siren Mail costs $295, a five-user license $1,395 and a 10-user license $2,495.

▶ *Siren Software*
(415) 322-0600



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Users gain cluster ability

By Thomas Hoffman
NAPERVILLE, ILL

NCR Corp. recently added fault-resilient software to its product cache, providing NCR System 3400 and 3500 users with the ability to cluster as many as four servers to one another.

The package, dubbed NCR LifeKeeper FRS Clusters, supports the parallel server feature of Oracle Corp.'s Oracle 7. The parallel server is a single but distributed parallel database environment that enables users to run the same application across multiple servers.

Data sharing

LifeKeeper FRS Clusters features a distributed lock manager that allows the systems that are clustered to share information using the Oracle parallel server. The core package was designed to maintain a "heartbeat" between systems and, in the event of system failure, switches applications and communication interfaces to another system in the cluster.

The package is a follow-up to LifeKeeper FRS, a set of fault-resilient software that NCR introduced for its midrange computer systems last January. LifeKeeper FRS provides high-availability and failover between two systems, while the latest package secures data between two to four systems and additionally supports database clustering, according to Asif Naseem, manager of strategic planning and solutions services for NCR's midrange computer systems division.

IBM, Sequent Computer Systems, Inc. and Pyramid Technology Corp. have already introduced Oracle clustering software, according to John Morrell, research manager for Unix software at International Data Corp. in Framingham, Mass. However, NCR's LifeKeeper was designed with additional failover capabilities that competing products have not yet addressed, Morrell said.

Michael Garrison, manufacturing and industrial engineering manager at State Industries, Inc., said the Ashland City, Tenn., water heater maker plans to purchase the LifeKeeper package when it adds a second NCR 3450 server in the next six to 12 months. "We'll want fault-resiliency between those servers when we put the second [NCR] 3450 in, so we're already talking to NCR about LifeKeeper for that," Garrison said.

LifeKeeper FRS Clusters, which runs on 2.01 RAS of NCR's version of Unix System V Release 4, is priced from $9,000 to $40,000 per system. Early shipments have already begun, with general availability of the products slated to begin at the end of December.

NCR eyes software growth with new unit

By Thomas Hoffman
COLUMBIA, S.C

NCR Corp.'s establishment of a dedicated software division is being viewed as an effort to unite diverse software efforts and to create the links necessary to carry out parent company AT&T's goal of a new portable computing environment.

The software division is also expected to lay the foundation for tighter development links with AT&T and Bell Laboratories, Inc. as AT&T moves forth with its plans to create "anytime, anywhere" portable computer software and products.

NCR's James E. Clark: *Competitive platform ports will be encouraged*

Software and services now make up more than 40% of NCR's annual revenue, or nearly $3 billion, according to Peter Kastner, a vice president at Aberdeen Group, a Boston-based market research firm.

However, although NCR's services revenue is growing at a faster pace than that of IBM, Digital Equipment Corp. and Unisys Corp., Kastner estimated that software sales currently account for only 7% of total revenue, or less than $500 million. This sales figure includes NCR's version of the Unix System V Release 4 operating system.

With the new software division, Kastner said he believes NCR will be better positioned to expand and develop its product cache. "NCR's software products have, to a certain extent, been languishing in different product groups. They may well do better in the full sunshine of their own product group instead of being shaded by bigger and more important product groups than they had been in," he added.

James E. Clark, who will head up the new software division, agreed. "We weren't getting the full thrust of the corporate might behind those efforts," he said.

Porting potential

For customers, the new division likely means NCR software will eventually become available on non-NCR hardware platforms. In addition to ongoing development efforts to migrate NCR software beyond its Unix environment to Microsoft Corp.'s Windows, Windows NT and IBM's OS/2, Clark said NCR plans to port its products to other platforms where user demand is strong.

"If there are enough customers who want that, [porting] will be done on a Hewlett-Packard platform, or Sun or IBM," Clark said.

Although Clark said the software division will focus primarily on product development for NCR's System 3000 platform, he added that competitive platform ports will be encouraged.

NCR, *page 105*

Client/server

Department store tackles inventory stockpiles

By Mark Halper
PLANO, TEXAS

Vivian Stephenson, vice president of MIS at Mervyn's department store, harbors no illusions of dismantling the mainframe operations that still run most of the company's business functions.

She does, however, see the wisdom of passing the data housed on the IBM ES/9000 mainframe down to a client/server system for processing on a Unix server and PCs, as evidenced by a new inventory management system that she estimates will help save the company millions of dollars this year.

"Mervyn's has the strategy to reduce inventory by $2 million to $3 million, and this is one of the tools that will allow us to do that," the MIS chief said.

Mervyn's Vivian Stephenson: *The company is on target with its 1993 inventory reduction plan*

After a four-month development period using KnowledgeWare, Inc.'s ObjectView development tool, the company launched its Planned Store Inventory (PSI) program last February on a 12-processor Sequent Computer Systems, Inc. Symmetry 750 Unix box housing an Oracle Corp. Oracle 7 database. Stephenson declined to say how much the company spent on hardware and software.

PC users download raw data from the mainframe into their ObjectView-based application, which transforms the data into a format recognized by a modeling application that resides on the Sequent box.

The ES/9000, meanwhile, continues to draw data that is updated daily from Mervyn's stores via a satellite connection.

Stephenson said the company is on target with its 1993 inventory reduction plan. Mervyn's senior technical analyst Steve Houston said the store runs about 26% of its inventory through PSI; he estimated that it may eventually use the system to handle 75% of its goods.

Reality check

In its early system development stages, Mervyn's ran prototype inventory management systems on PCs that simulated real-world merchandise movement.

Until last February, Mervyn's ran inventory management on a mainframe, which broke down demographic differences only by region, not on a store-by-store basis.

Much of the store's nonfashion menswear — items such as jeans, slacks and underwear — are on the system, Houston said, but fashion clothing is not yet. "They're harder to do because they change every three months," he noted.

Merchandising aid

The benefits of the new system are twofold because Mervyn's PSI also figures out exactly what merchandise is needed in particular stores, and when.

Before the retailer installed PSI, its approach to determining which items to ship where was practically a manual one, Houston said. Users would draw data off the ES/9000 using NCR Corp.'s 386-based Teradata database machines and the Focus fourth-generation language from Information Builders, Inc.

"They also used a lot of calculators," he recalled.

Mervyn's, *page 80*

Mervyn's tackles inventory stockpiles

CONTINUED FROM PAGE 79

The new precision merchandising translates into more sales — which Stephenson declined to estimate — and higher customer satisfaction because it increases the chances that consumers will find what they want to buy.

To illustrate the point, Stephenson noted, "We have 275 stores in 15 states, and we're trying to figure out how many red medium-size T-shirts to send to each of them, when you have different demographics in each."

Valuable information

The intelligence of the Sequent based PSI provides Mervyn's with such vital insights as to send lighter-colored shirts to Florida, helping the company avoid an overstock of red where red is not wanted, she said.

Since installing PSI, Mervyn's figures that it has scored at least a 98% success rate in having an item in stock when a customer requests it.

Meanwhile, Mervyn's client/server operation resembles its mainframe setup in one logistical sense: Mervyn's Sequent box sits far away from its Hayward, Calif., users, in a glass house with the ES/9000 in Plano, Texas.

Mervyn's moved data center operations to Texas two years ago because the old site, at the company's Hayward headquarters, sits squarely on a geological fault line.

Systems link

In Hayward, about 100 inventory control analysts operate PCs — tied together on a Token Ring network — that access the system via leased T1 lines running to Plano. An Interlink Computer Sciences, Inc. gateway in Plano provides the final link into the ES/9000's channels.

Houston said that developers spent arduous hours sorting out memory management conflicts between the PCs, which tie into the Sequent box over TCP/IP but also run Novell, Inc. NetWare for other tasks.

"Having the right merchandise in the right stores at the right time sounds simple, but it's difficult to execute," Stephenson said.

Still not a mainframe

Not everything is up to par. Stephenson noted that the system still lacks the sophisticated security and change management features the company has grown accustomed to in the mainframe world.

"Some of the things we got used to on the mainframe system are still in their infancy on the client/server side," she said. "We haven't had problems, but we don't consider them to be up to mainframe standards."

ON SITE

Mervyn's
Plano, Texas

Challenge: To reduce inventory costs and increase sales by having the right products at the right stores at the right time.

Strategy: In-house-developed inventory management system that uses a Sequent minicomputer and Oracle database tied to a network of PCs on one end and a host mainframe on the other.

Status: On target to cut inventory costs by $2 million to $3 million this year. Company expects to control inventory with the new system by sometime next year.

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PORTRAIT OF THE IDEAL IS Manager

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The truth of the matter is this: your IS manager has only two hands. Of course, for your mainframe environment, that may have been enough. He or she managed a system that was located inside a single glass-walled computer room — probably right around the corner from his or her office.

That scenario is changing. And changing rapidly. Downsizing from mainframes, even large clusters, to small distributed servers linked with PC clients presents new and challenging system and network management requirements.

All the traditional functions IS once performed — maintaining corporate data integrity, maximizing performance, reducing costs, planning capacity, and more — must now be performed by individual users who may not be as experienced as IS professionals, and who could be located on the other side of the campus, the country, or the world.

Imagine a totally intelligent, self-managing environment of networked computing systems, working across an entire enterprise and all its multi-vendor system platforms and networks. This is Digital's POLYCENTER strategy.

Today, businesses that are moving to network-based, multivendor, distributed processing environments can turn to Digital for a complete systems and network management solution that's cost-effective. It's called the POLYCENTER solution.

Meeting the Challenges of Your Complex Computing Environment

According to the 1993 Sentry Market Research Survey, IS managers listed lack of systems management control as the greatest impediment to successful client/server implementation. In fact, the movement toward distributed computing brings with it a number of specific needs in the areas of:

- Storage Management
- Configuration/Change Management
- Fault/Problem Management
- Performance/Capacity Management
- Automation
- Security Management

Digital's full range of POLYCENTER products and services offers comprehensive solutions in each one of these areas. What's more, based on industry standards, the POLYCENTER solution is an integrated and open approach to managing enterprise systems and distributed networks, including those based on OpenVMS, OSF/1, ULTRIX, other UNIX variants, IBM MVS, MS-DOS, or Windows NT operating systems.

And as needs and technology change, so will POLYCENTER offerings be enhanced to meet all your business requirements — today and in the future.

Three Requirements — Three Solutions

Three POLYCENTER products that have been newly enhanced include DEC Network Save and Restore (DECnsr), POLYCENTER System Census, and POLYCENTER Scheduler. Each product addresses an area of management made more complex as a result of the move toward a client/server environment.

For Storage Management, You Need DECnsr Software

Storage management means making sure information is protected as well as quickly retrievable.

In a mainframe environment, the disk drives are all in one place — making the process of backing up data relatively easy to monitor and control. However, in a client/server environment, you're dealing with a variety of PCs and workstations. Users have disk drives right on their desks, and the information they keep on these drives is often critical to the company. Thus, backup is not only a good idea, but also essential. Yet, what are the chances that every user will back up their data every day?

With DEC Network Save and Restore, backup is automatic — and nothing is left to chance. No matter where data resides in the corporation and no matter which desktop client that information resides on, DECnsr software provides backup services either to a single system or to a group of systems on the network, and retrieves data from backup copies, when needed.

Most important is the fact that DECnsr software is one of very few backup solutions that offer support for a wide range of platforms including those of Digital, IBM, Hewlett-Packard, Sun, and others, as well as DOS platforms.

In addition, DECnsr software provides easy backup, restore, and fast file location operations, simultaneous output to multiple devices, and media management index for tracking tapes, among many other capabilities.

The benefits of DECnsr software are clear. You can expect not only a substantial decrease in lost data and lost time but also a dramatic increase in data integrity.

Configuration Management Made Easy with POLYCENTER System Census

Configuration management essentially means knowing what assets you have, where they're located, and in what condition.

In a mainframe environment, an IS manager simply has to walk into the computer room. But, it becomes more complicated when you're responsible for 50, 100, 500, or more multivendor systems distributed throughout the country or around the world.

Through three types of modules — data collection agents that reside on the network and collect information on their particular systems, a data consolidator that manages and updates a central database of all agent information, and a graphical user interface for easy identification of objects in the central database — POLYCENTER System Census software automatically gathers and displays system configuration information quickly, clearly, and accurately.

Information that is routinely available upon request includes:

- Hardware data, such as processor, memory, disk, tape, print server, adapter, and controller
- Software data, such as name, version, type, and license for operating system and layered products

continued

continued

- Logical structure data for VAXcluster systems (OpenVMS specific), disk partitions (ULTRIX specific), queues, and users

What else can the POLYCENTER System Census do for you? It can increase productivity by freeing scarce operation resources, plus reduce costs by uncovering any configuration redundancy.

POLYCENTER Scheduler Offers Increased Automation Functionality

Increased automation of business operations can translate into higher productivity, better service, and lower costs.

But automating tasks within a client/server environment is a tremendous undertaking for IS managers. Automating one mainframe system is not difficult compared to the process of automating tasks on many different systems distributed on the network.

Digital offers you the solution — POLYCENTER Scheduler. A production scheduling application that operates across LANs and WANs in a mixed OpenVMS, ULTRIX RISC, Windows NT, or DEC OSF/1 AXP environment, the Scheduler automates monitoring, scheduling, and repetitive applications such as payroll, manufacturing, resource planning, and financial consolidations.

It accomplishes all of this through a server module that keeps track of all the time elements involved (contingency plans, calendar dates, hours/minutes, etc.) and through client modules located on the network that actually run the tasks.

Digital's POLYCENTER Scheduler can help you cut error rates of production jobs, avoid costly reruns, reduce slack time between jobs, maintain job integrity through error recovery, plus much more. The bottom line? Greater productivity and even greater savings for your business.

For details on workshop registration, or to request a copy of the "POLYCENTER and Enterprise Information Systems Management" report, prepared by the Aberdeen Group, call Jill London at 800-457-8211. ■

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Digital is presenting a series of operations management workshops entitled "Managing Technology in Transition." Topics will range from performance analysis to network management to storage issues and more. Attendees will also see live demonstrations of solutions to actual operations problems. Find out how you can manage the new client/server environment of the '90s at a FREE workshop near you.

UNIX WORKSHOPS	LOCATION	OPENVMS WORKSHOPS

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The economy has taken its toll on computer suppliers. However, there is a "light at the end of the tunnel" for those suppliers that have the ability to respond quickly to customer business needs. Digital is one such organization — finding new opportunities to help companies respond to today's business challenges.

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A glance at today's headlines shows some computer companies consolidating and redefining their products and services to better meet your needs. Digital has been listening carefully to your concerns and is prepared to help.

How? By offering you a long-term, stable computing environment, a 25-year architecture with Alpha AXP, database and graphics capabilities, and a clearly defined path to get there. Together with recognized software vendors, Digital will provide the hardware products and software conversion tools you need to migrate to VAX VMS, Alpha AXP running OSF/1 or OpenVMS, ULTRIX on DECsystems, or SCO UNIX on Intel.

In short, we can provide you with a complete set of migration solution services.

Good News for Prime Customers

To remain competitive in today's market, businesses must anticipate their computing needs. Companies currently dependent on Prime technology are facing several challenges, including when and how to:

- Upgrade current technology without losing the entire investment in their Prime-based solution
- Move their business applications to a computing architecture that meets their open systems requirements
- Plan the migration to a new platform within a timeframe that makes good business sense and is easy to implement
- Implement a client/server strategy
- Contain or minimize operation costs

In spite of these challenges, there is good news. Through its investment protection program called Digital Solutions for Prime, Digital offers Prime customers a clear growth path to 21st century computing.

Simple, Practical Solutions

Whether your business goal is migration, coexistence, technology upgrading, or containment of operation costs, Digital has the consulting experience and tools you need today. In fact, our Solutions Integration Unit — along with our Independent Software Vendors — was on hand at the National Prime Users Group Conference recently to demonstrate Digital Solutions for Prime on the Alpha AXP platform.

Companies previously dependent on Prime have transitioned easily to Digital platforms because of all we have to offer, including:

- Prime migration/conversion consulting experience and extensive tool set
- A choice of operating system environments such as PICK, OSF/1, OpenVMS, ULTRIX, and SCO UNIX
- An unparalleled selection of software applications for each of these operating system environments
- Multivendor systems and network service

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StorageWorks™ Product Family

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Recently we started talking — and listening — to our customers through a number of different avenues including surveys, on-site visits, and product direction forums. You spoke candidly about your business situations, your needs, and your expectations.

As a result of these discussions, Digital arrived at a computer storage strategy that answers all your requirements. The StorageWorks product family is the result of that strategy.

In brief, Digital's StorageWorks products can provide you with the flexibility to attach industry-standard storage devices across SCSI-based systems for CI clusters. In the future, this flexibility will extend to DSSI clusters and FDDI rings. Easily integrated with our current SDI/STI and RF/TF products, the StorageWorks products enable you to choose solutions that strike an ideal balance of performance, availability, and cost for nearly every storage requirement.

It's Yours for the Asking

Listen to the people who buy the products. It's a simple but important philosophy. And once we listened, the rest was easy.

You asked for a number of must-haves for storage solutions in the downsized business environments of the '90s. Not only should this new generation of storage be based on open standards, but it should be:

- High-performance
- Flexible
- Cost-effective
- Reliable
- Modular
- Easy to configure, to maintain, and to grow

And, most important, you sought to protect your current investment in storage and your new investment well into the future. In other words, you asked that we make storage work not only for Digital platforms but also for a variety of multivendor platforms.

With StorageWorks products, Digital has begun to fulfill all these business requirements. We've recently introduced our first line of StorageWorks products running on Digital platforms. And, as we continue to stay close to customer concerns, this product family will soon evolve into cost-effective multiplatform solutions for your ever-changing, multivendor environment.

What Is the StorageWorks Solution?

We've all ordered a hamburger just the way we want it — the works, no pickles, a little onion, or just a dab of mustard. Imagine doing the same with storage. Imagine acquiring a storage solution that is customized specifically for your business.

The StorageWorks family of products implements a complete subsystems strategy that enables you to obtain the exact storage you need by choosing from an interchangeable set of components. These include storage devices, controllers, power, packaging, interconnects, cache, and software.

This modular approach makes it possible for you to mix and match devices and components in almost unlimited combinations. What's more, by designing these storage products so that you can replace every component yourself, Digital has achieved a breakthrough in storage cost-of-ownership.

It Begins with Building Blocks

SCSI-based storage devices such as magnetic and solid state disk drives, tape drives, and CD-ROM drives — housed within carriers — are the basic building blocks of StorageWorks subsystems. These building blocks are easily mapped to to or out of StorageWorks shelves and enclosures when you want to expand or reconfigure your data storage capability.

Digital's family of StorageWorks controllers will optimize the performance of these building blocks through unique features that enable SCSI devices to achieve "bet-your-business" levels of availability, including the benefits of RAID (Redundant Array of Independent Disks) technology.

Key StorageWorks enclosure components include:

Building block shelves

Supporting multiple building blocks either in cabinets or at deskside when enclosed in a pedestal kit.

Controller shelves

Supporting electronics to as to provide enhanced capabilities to devices operating on multiple SCSI buses.

Datacenter cabinets

Holding building-block and controller shelves plus tape backup subsystems to provide complete storage solutions.

In addition, desktop expansion units enable PCs and workstations to use the same building blocks you configure on larger systems. And redundant elements and battery backup can be added at any time to build highly available configurations.

The Future of StorageWorks Products

As StorageWorks solutions extend beyond Digital platforms to focus on multivendor platforms, we will place increased emphasis on developing business partnerships to enhance our expertise on a variety of non-Digital platforms.

We will also continue to measure our products against those of our competition. If we need to change direction to stay ahead of customers' needs, so be it.

After all, Digital intends to be a leader in the storage solution business. With your input and our expertise, it won't be very long before that goal is achieved.

To learn more about Digital's StorageWorks product family, call 800-DIGITAL (800-344-4825), reference code BFF, and ask for a FREE StorageWorks information diskette. ■

PUTTING IMAGINATION TO WORK

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Depending on your level of networking expertise, you may simply want to purchase individual cost-effective products, or you may want to take advantage of our full range of network products and services. Better yet, you can focus on your business while Digital takes care of complete implementation of a network strategy — customized to perfectly suit your business requirements.

Success Based on Experience

When it comes to networking expertise, experience counts. As an industry-leading systems integrator, Digital was chosen by many global companies to install their enterprise networks — from settling connectivity issues and meeting internetworking challenges to providing management capabilities from branch offices to regional sites and corporate headquarters.

Digital's work with market leaders in aerospace, finance, and retail industries, to name a few, has helped us develop a thorough understanding of the complete networking problems businesses face. This work has allowed us to gain valuable experience in providing client/server computing that spans from network interface cards in desktop PCs to branch office solutions to corporate backbone networks, including the datacenter.

And in this decade of upsizing, downsizing, and rightsizing, Digital is answering your need for networking products that work across all the most popular platforms, protocols, and media. Today, our networking products are targeted for the open, worldwide information technology market. These products include:

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- Access routers that support industry standards such as Open Shortest Path First (OSPF), integrated Intermediate System to Intermediate System (IS-IS), and Interior Gateway Routing Protocol (IGRP) for Cisco environments
- Hubs that support Token Ring as well as Ethernet and FDDI
- High-performance, reliable backbone routers with leadership TCP/IP performance
- High-performance multi-gigabyte FDDI switches

All of these are manageable through HUBwatch, Digital's network management application, as well as through a broad range of other vendors' network management packages utilizing SNMP.

Digital's networking product strategy is complemented by our growing relationships with business partners such as Merisel, Gates F/A, and Anixter — partners that add their own brand of expertise as we expand our networking family of products.

What's more, Digital will introduce ATM capability that is compatible with existing LAN technologies. By integrating ATM products into Digital adapters, hubs, and switches, we assure you a seamless growth path for your computing environment.

In short, Digital is taking steps to protect your current technology investments while giving you the freedom and flexibility to meet future business goals.

For more information on any of Digital's family of networking products and services, call 800-DIGITAL (800-344-4825) and reference code BFE. ■

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PUTTING IMAGINATION TO WORK

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Hired to hack

Companies hire the Price Waterhouse team to hack into their systems and evaluate weak links

By James Daly
NEW YORK

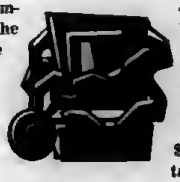
If you want to know how strong a lock is, try to crack it. How well-built is that rope? Run a strength test.

The same principles hold true for information security, where a whole range of people are ready to hack into your system and tell you where the weak links are.

Among the most widely respected security experts is a team at Price Waterhouse's Management Consulting Services, which for the past few years has engaged in what are known as "Data Security Penetration Studies." Business has been good, said partner Jonathan Harris, because as networking spreads, so do a system's vulnerabilities.

"People are going after your system every way imaginable: dedicated lines, public phone systems, local on-site terminals," he said.

The Price Waterhouse team is a sort of do-it-yourself hacker unit. Comprising three or four people, the team attempts to penetrate computer environments by going over, under and around every security system you throw at it.



Although the team is typically hired by systems security, many times it is brought in at the behest of a senior executive. The computer department will not be told of the penetration study in advance. "It keeps people on their toes," Harris said.

Harris said the "hired hackers" approach the task on four levels: as outsiders with no company information; outsiders with some company information (such as an ex-employee bent on destruction); insiders with no company information; and insiders with standard company application programmer access.

The penetrators do not actually sport criminal records because clients are typically uncomfortable with that idea, Harris said. They are full-time Price Waterhouse employees. "We don't use stringers," Harris said. "The work is too sensitive, and we can't let that sort of knowledge get outside of our company."

A typical study by Price Waterhouse includes carefully designed security penetration activities of selected mainframe, midrange and desktop environments. Fees range from $40,000 to $120,000, and the study can take anywhere from two to eight weeks, depending on the attack scenarios and the number of sites involved.

Although each study is unique, Harris said he finds the same weak links in many sites. "It's usually pretty easy to get into a LAN because so many people use easily guessed passwords or the default password," Harris said. "And most LANs contain gateways into other environments. So once you're in, you have the keys to the kingdom."

The service conducts reviews of current security practices and then recommends a security plan. Upon completion of the study, Price Waterhouse provides the client with an evaluation of the level of information available to a potential hacker as well as the security measures that should be in place.

Such systems penetration services from established firms have drawn the derision of ex-hackers who have gone straight and provide similar services.

"These guys are not out there playing in the keyboard jungle day in and day out," said Ian Murphy, an ex-hacker who provides a security penetration service as president of IAM/Secure Data Systems in Norristown, Pa. "They get all their tips from manuals and briefings. They're not out there going through dumpsters, chatting on the hacker bulletin boards and getting the real story on what's vulnerable like we are."

Not true, said Harris, who claims his team is skilled in even the most minute technical details. "The main question you want to ask with any service like this is, 'Do you trust these people?'"

HP readies Image/SQL indexing

By Mark Halper
SAN FRANCISCO

■ Hewlett-Packard Co.'s database group last week outlined modifications to its Image/SQL database that will accommodate a highly desired indexing feature for the proprietary database.

But that feature will not be delivered for a year, and users will have to wait for other improvements they hope to see in the database. These include a Data Description Language (DDL) that would give the hierarchical database more of a relational feel. DDLs permit users to restructure data sets without unloading and loading data.

In the meantime, Jim Sartain, Image/SQL laboratory manager, said HP is modifying the database so that b-tree indexing programs from Dynamic Information Systems Corp. in Boulder, Colo., and Bradmark Technologies, Inc. in Houston will work with the database's SQL interface. The company will, however, stop short of actually handling a b-tree feature into Image/SQL.

B-tree indexes slash the time it takes for users to execute generic searches in a database, such as when looking for all mentions of a particular town that may be scattered throughout voluminous records.

Until the new software is delivered, Bradmark's and Dynamic Information Systems' b-trees can use only a more traditional interface, effectively nullifying the SQL implementation of the database and relegating users to flat-file queries, Sartain said. That will be fixed.

Users have voiced a strong interest in b-tree indexing for Image/SQL. SIGimage, a special interest group related to the HP user group Interex, declared the b-tree feature its top request during a conference in Birmingham, England, last summer.

Image/SQL, formerly known as Turboimage, was written exclusively for HP's HP 3000 multiuser system and that machine's MPE-IX operating system.

Last December, HP announced it was taking a large step toward making Turboimage relational by adding SQL to the program [CW, Dec. 14, 1992]. That move pleased HP 3000 users who had long complained that HP was offering a relational database, called Allbase, to HP 9000 Unix users while neglecting the relational needs of HP 3000 users.

Image/SQL is currently in beta sites, where users are implementing DDLs from third-party suppliers including Adager Corp. in Sun Valley, Idaho, Dynamic Information Systems and Bradmark.

Adding a DDL to Image/SQL is one of several enhancements that HP has "under consideration," Sartain said. HP is also looking into providing on-line backup routines, support for binary large objects and two-phase commits, he said. The company plans to poll users' interests at the Interex conference.

Wirt Atmar, president of AICS Research, Inc., a University Park, N.M., Image/SQL report writer vendor, pointed out that if HP is to rightfully claim Image/SQL as a relational database, it must add an intrinsic DDL to the program.

"People have confused the word relational and SQL," he said.

Ken Sletten, project engineer at the Naval Undersea Warfare Center in Keyport, Wash., observed, "Right now, you can't add an index or drop an index on the fly — basically, you can't manipulate the structure of your database on the fly."

Alfredo Rego, president of Adager, noted that even though third-party vendors provide a DDL, they do not always conform to SQL standards. For instance, Adager's DDL is not written in SQL syntax, so it uses a different command vocabulary than what SQL prescribes.

Rego said the syntax difference is minor, but he and others agreed that users want a program that conforms to SQL standards.

Trying to please

HP asked users last week if they would like Image/SQL on the HP 9000 Unix platform — a move that would help HP retain accounts migrating from the HP 3000 to Unix. HP estimated that Image/SQL is loaded on all installed HP 3000s, which number 55,000. It declined to estimate the installed base of its Allbase database, which it sells for its HP 9000 Unix system and also for the HP 3000. Some users said they think HP will combine the two offerings.

Answering the call

Users praised HP for generally heeding the call of irate HP 3000 users who had complained about the firm's past failures to develop relational qualities for Image/SQL.

"HP has come a long way since the Boston Tea Party," Sletten said, referring to a 1990 Interex meeting in Boston at which HP 3000 customers staged loud protests demanding relational enhancements to Image/SQL.

Oracle chief sets delivery for Media Server

By Kim S. Nash
ORLANDO, FLA

New versions of Oracle Corp. databases capable of manipulating video and sound are anchoring tests of interactive TV applications at Bell Atlantic Corp. and US West. Oracle's so-called Media Server products are expected to be on hand this week at International Oracle Users Week.

Experiments are in the works with Bell Atlantic and US West to bring applications such as home shopping and video on demand to homes within the telephone companies' calling areas, according to Oracle executives.

Media Server is an umbrella term for massively parallel database modules designed to handle images, full-motion video and CD-quality sound, according to Larry Ellison, Oracle's chief executive officer. Pieces of Oracle Media Server, including an object-oriented development tool kit for building interactive TV programs, are due to ship to developers in January, Ellison said.

Media Objects, which marks Oracle's entrance into object-oriented technology, also contains a real-time operating system and user interface designed to run on set-top boxes. Set tops are computer-style boxes that sit atop TVs to help home viewers navigate the interactive world.

Set-top boxes running Media Objects will be able to talk to DOS and Macintosh operating systems, Ellison said, adding that the product will require 2M bytes of disk space.

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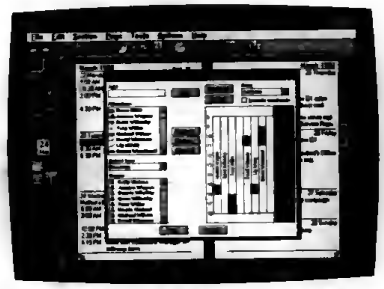

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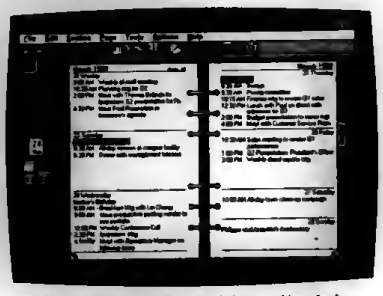

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German firm heads to client/server era

By IDG News Service
KIEL, GERMANY

OUT sourcing

For Krupp Mak Maschinenbau GmbH, outsourcing marks the beginning of the client/server era.

The company's in-house profit center, Mak Data Systems (MDS), ran Krupp Mak's information systems operations until recently, when it placed that responsibility in the hands of a Dortmund-based data center that belongs to the Hoesch-Krupp group. At the same time, Krupp Mak began work on a decentralized architecture across all divisions of the mechanical engineering company.

MDS is determined to abandon in mid-1994 its 55 MIPS Hitachi, Inc. mainframe-based data center, which has supported IS services for 30 years.

"We know by now that the most economical solution is to get rid of the mainframe," said Hans-Ulrich Neite, director of Krupp Mak's IS unit and chief at MDS. He estimated that the transition to a decentralized platform will take two to three years. "When we began thinking about a more economical IS solution three years ago, we were not aware that eventually we would go client/server.... Initially, we were considering the outsourcing route."

After two years of negotiations with outsourcing companies such as Electronic Data Systems Corp., Debis and NIS Kiel (an IS subsidiary of Preussag and HDW), Hoesch-Krupp decided to consolidate the IS activities of all its companies at the one Dortmund site.

Move to client/server

Hoesch-Krupp also decided in mid-1992 to set up a client/server architecture to be implemented in value-added Krupp Mak divisions. These include operations such as manufacturing, maintenance of production facilities, materials management and control, quality management, product development, marketing and sales, customer service and administration.

Krupp Mak considered a contract with an outsourcing company, but under a new Hoesch-Krupp policy the firm could tap an outsourcer to handle computer operations only for a limited, three- to four-year transitional period.

"Had we decided to keep our own IS operations running until all new solutions are implemented, we would have been faced with the mounting costs of the new environment, in addition to regular expenses incurred by operating our own data center. If you decide, however, to pass the entire data center into the hands of an outsourcer, you can cut these operating costs step-by-step, as the new system is being implemented," Neite explained.

Of course, the outsourcer must accept the fact that the scope of services it is supposed to provide diminishes as the project proceeds. As more parts of the decentralized solution are finished, a firm should be in a position to cancel the corresponding "central" services provided by the outsourcer.

Such an approach, however, is not really to the liking of major outsourcing companies such as EDS or Debis. Their favored contract periods usually range from five to 10 years. Only NIS Kiel offered a contractual model that was comparable to the one drawn up by the Dortmund-based data center, Neite noted.

Transition phase

In mid-1994, operations will be handed to the new site in Dortmund. Both Krupp Mak and MDS' external customers will then get their IS services on-line. Concurrently, the company will start building the new architecture, introducing new solutions piece by piece. At the end of the transitional phase, Neite said he expects to have four IBM RS/6000 machines — in as yet unspecified configurations — acting as servers under IBM's AIX operating system. Various types of PCs will act as clients, taking the place of the current 500 PCs and 3270-type terminals.

MDS is banking on various software vendors. It chose SAP AG's R/3 package for commercial tasks and human resources. "Yet administrative functions are not really our key concern," Neite said. "In fact, in implementing R/3, we found a solution to a problem that has actually long been resolved."

For value-added processes, Krupp Mak will use Software AG's Prodis Unix-based production control application, which the company considers to be a "perfect alternative product to R/3."

"Prodis is a core solution which allows us to adapt the software to our specific needs very easily," Neite said. In areas such as product development, marketing and customer support, Krupp Mak will continue to use its own homegrown solutions. Software AG's Adabas will remain the central database.

The firm's affinity to SAP as well as to IBM — because MDS acts as distribution partner in the RS/6000 business — is partly because of long-standing business relations. Meanwhile, a number of MDS' clients are external customers, and the firm generates 45% to 50% of its sales revenue by offering solutions for Adabas and Software AG Natural environments.

The road ahead

It will take two or three years before all IS services are running on a client/server basis, Neite predicted. The company expects to save some $1.08 million, or 30%, per year over today's IS operating costs. Neite would not detail the project's cost.

"So far, we have calculated the costs for only two of the areas, and since the server configuration is still unclear, we are not able to be specific on the overall costs of the project as yet," Neite said.

NCR software unit's efforts

CONTINUED FROM PAGE 79

"I think it's important to win over the hearts, souls and business of NCR's brethren, but I do not feel bound in any way to that environment," Clark said.

Clark also said he views the software division as an additional opportunity for NCR to implement AT&T's vision of converging computing and communications.

Software and services make up more than 40% of NCR's annual revenue or nearly $3 billion

Since AT&T acquired NCR in 1991, the two have worked closely with AT&T's Bell Laboratories research unit to develop technologies that can facilitate remote communications.

"I believe we'll be an important component of 'Anytime, Anywhere.' We think that's where the world is going," Clark said.

[redacted]

Software Engineering of America has announced Total Report Management Solution (TRMS) Release 4.3, an end-user/report management component of the firm's automated output management system Savrs/Trms, for MVS environments.

According to the Franklin Square, N.Y., company, the product features an on-line index and table of contents that enables users to quickly locate specific information in a report by selecting from a customized on-line list.

Scrolling or searching through the report by character or page is not necessary.

When there is a change in the value of designated fields on the report-image page, a Break On feature automatically creates distribution.

TRMS now supports records of up to 32K bytes in size.

Prices for TRMS range from $27,500 to $55,165.

▶ *Software Engineering of America*
(516) 328-7000

American Software has announced the AS/400 Client Series, workstation-based products using the IBM AS/400 as a server.

The series consists of a family of client applications and decision-support productivity tools for increased functionality and network capabilities for distributed processing among servers.

The tools were also designed for Microsoft Corp.'s Windows environment and Windows NT operating system.

According to the Atlanta-based company, the series encompasses a range of workstation-based application capabilities interacting with enterprise databases residing on one or more AS/400 enterprise servers.

Workstation-based functions such as customer service, accounting, purchasing, distribution/logistics and manufacturing are areas of focus for the product.

Pricing for the series is $100 to $600 per component.

▶ *American Software*
(404) 261-4381

Grafpoint, Inc. has announced GT-320 for Windows, GT-340 for Windows and GT-X 340, three Digital Equipment Corp.-style terminal emulators.

GT-320 for Windows is high-performance VT320 terminal emulation software for alphanumeric application users. GT-340 for Windows emulates VT340 terminals and can be used for Regis-style graphic applications.

According to the San Jose, Calif.-based company, GT-X 340 is an X Window System client application supporting Regis, Digital and VT320 alphanumeric terminal emulation on an X display.

Pricing begins at $195.

▶ *Grafpoint*
(408) 446-1919

SAP America, Inc. has announced the availability of Oracle Corp.'s Oracle 7 database for SAP's R/3 client/server business applications software.

According to the Philadelphia-based company, R/3 applications use Oracle's technology specifically to ensure stability and reliability in the management of large data sets and in the processing of large transaction volumes within a client/server environment.

Users may benefit from Oracle 7 features that include stored procedures, a parallel server option, triggers and transparent distribution with two-phase commit.

Pricing ranges from $19,000 to $76,000, depending on the number of users.

▶ *SAP America*
(215) 521-4500

Novadyne Computer Systems, Inc. has announced Reality-Check, an on-line software utility designed for the McDonnell Douglas Corp.-based Reality line of minicomputer and super minicomputer systems.

According to the company, which is based in Santa Ana, Calif., the software is a multifunction system management tool that continually monitors system resources, providing critical data for system management and automatically enhancing system integrity.

Pricing for the utility is $1,565.

▶ *Novadyne*
(714) 566-2000

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FOCUS For AS/400 From Information Builders. Its Plain English Syntax Makes Complex Report Writing This Simple.

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IBM has selected Information Builders as an Industry Application Specialist and a member of the IBM Customer Advisory Panel for Application Development on the AS/400 platform. And they've done it because feature for feature, they know there isn't a better 4GL you can buy.

Don't just take our word for it. An independent study showed that 100% of FOCUS for AS/400 users rated the product as excellent and would purchase it again.

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Wang to open Pace tools

By Craig Stedman
LOWELL, MASS

Wang Laboratories, Inc. plans next month to add Open Database Connectivity (ODBC) support to the query tool in its Pace for Open Systems application development product line. That will represent the first step toward decoupling the Pace tools from the database with which Wang currently integrates them.

The company hopes the decoupling strategy will let it move Pace for Open Systems into the general-purpose development tools market.

Wang's linkage of the tools to its own database blocks that process and has been criticized by some users who are migrating from Wang's VS computers to Unix systems and changing databases [CW, July 12].

Support would help

The lack of support for outside databases "is very, very limiting, to say the least," noted Ajit Kapoor, a principal at Intelligent Solutions in Marshfield, Mass.

Neil Exter, director of open software marketing at Wang, said the company has sold more than 6,000 Pace licenses, although most were for the VS versions of the software. He declined to break out the number of licenses for Pace for Open Systems, which just started shipping this year.

The ODBC-compliant version of Wang's Query Builder tool should be able to query any database written to the ODBC specification for decision support purposes, Exter said. The new software will have "significantly different code" than the existing Query Builder and will be marketed under another name, although the Windows graphical user interface will be similar, he added.

Wang expects to follow up the Query Builder move in 1994 by separating the Application Builder portion of Pace from its database, Exter indicated. The company is trying to interest major relational database vendors in joint development deals, he said.

However, Exter noted that Wang is still "evaluating what the appropriate technical approach is" for hooking the development module and a companion dictionary tool to external databases. "When you're just doing query, it's a simple thing," he said. "When you start doing [application development], it becomes more difficult."

Exter would not say which outside database would be supported first, but industry observers pointed to The ASK Group, Inc.'s Ingres software as a leading candidate, given a recent deal under which Ingres will resell Wang's imaging software. Marilyn Bohl, director of worldwide engineering at Ingres, declined to comment on the matter.

Fleishman-Hillard, Inc., a St. Louis public relations firm, just started shifting from VS machines equipped with Pace to a Unix client/server setup using Informix Software, Inc.'s database and Powersoft Corp.'s development tools. But Stephen Jung, vice president of corporate computer services, said he would give Pace another

Wang, *page 110*

Setting the Pace

Wang's Pace for Open Systems application development software includes four tools for use on Windows-based PC's, plus the company's own database

DICTIONARY BUILDER: Defines data properties and business procedure rules and stores them in a centralized dictionary. Supports triggers, referential integrity and event formulas.

APPLICATION BUILDER: Creates Windows front-end applications through a GUI. Allows integration of image and video files and access to spreadsheets and word processing documents.

QUERY BUILDER: Icon-based, ad hoc querying tool for retrieving data from a database.

REPORT BUILDER: Generates reports, mailing labels, forms and form letters using retrieved data. Based on Concentric Data Systems software.

PACE SERVER: SQL-based relational database with built-in client-level administrative tools. Runs on IBM and HP Unix systems.

Source: Wang Laboratories, Inc., Lowell, Mass.

Applix lays framework for app integration

By Melinda-Carol Ballou
WESTBORO, MASS.

Applix, Inc. last week introduced ApplixWare, a series of products for integrating applications and business data for end users, information systems managers and application developers.

While some of the ApplixWare products, including a database access package and a programming tool, are new, Applix has primarily repackaged its office automation and other software to be more of an integrated family rather than

The ApplixWare product line *includes Applix Graphics, a drawing package that integrates graphics with data*

discrete products. This new family, Applix said, can be more easily combined with other third-party software.

"Applix is repositioning its products with new features toward more of what they really are . . . making Unix look like one integrated desktop," said Rikki Kirzner, an analyst at Dataquest, Inc., a consulting firm in San Jose, Calif. "It pulls all the office applications together to make Unix thoroughly usable."

Based on Applix's Asterx, ApplixWare makes it easier to access, share and present information across Unix, PC desktops and the enterprise, the company said.

Access to databases is provided via ApplixData, a new product. By the end of this year, Applix will offer ApplixBuilder, a programming tool for developing applications on-

ApplixWare, *page 108*

IBM expert system app answers tech questions

By Ed Scannell

Hoping to speed up the development of OS/2 applications, IBM's Personal Software Products (PSP) has rolled out an expert systems-based application that helps corporate and third-party developers solve their technical problems.

Integrating intelligent retrieval technology, AskPSP lets developers describe a problem in plain English. The system then either responds with a series of possible solutions, based on a library of case studies, or asks additional questions to hone down its search for answers.

AskPSP integrates a beta version of Inference Corp.'s CasePoint Version 1.3 for OS/2. CasePoint supplies high-speed, read-only access to case study libraries developed with Inference's CBR Express, a tool for creating case-based retrieval systems.

CBR Express incorporates Inference's ART-IM development tool, which lets developers create intelligent client/server applications, an Inference spokesman said.

Once AskPSP receives a question, it "immediately produces a ranked list of likely cases where you might find your answer," said Avron Barr, director of marketing at Inference.

At the same time, the program generates a list of questions to help users better understand a developer's particular situation and determine whether it has seen this set of circumstances before. The program uses deductive reasoning, asking questions that developers then use to zero in on the possible culprit.

Each answered question is scored or rated so developers know whether they are getting closer to or further away from a definitive answer.

Real questions from real users

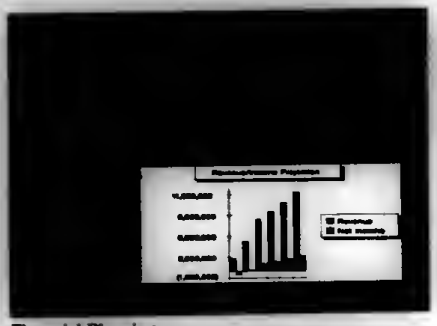
The individual cases that make up the library were written by people who answer the company's technical support hot line, not documentation writers.

The data contained in the cases is the most current information available and is organized around the way developers phrase their problems over the phone.

If developers cannot find a solution to a problem, they can generate an "unresolved case," which they can send to IBM technicians. The resulting body of unresolved cases then becomes a shared resource among developers, who can loosely collaborate with IBM technicians on possible solutions.

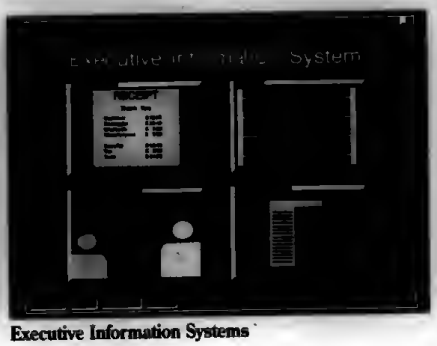
IBM has distributed AskPSP at no charge to more than 2,000 developers. The company said it will have a limited number of free copies of the program available to developers working on OS/2 and IBM LAN Systems products.

Corporate and third-party developers who want a copy of the program should call Personal Software Products Developer Assistance at (407) 982-6408.



Financial Planning

Econometric and Time Series Analysis



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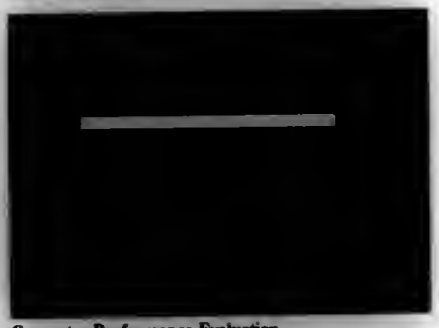

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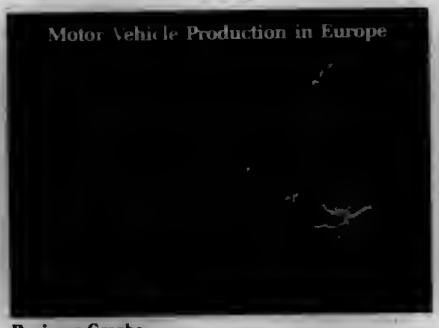
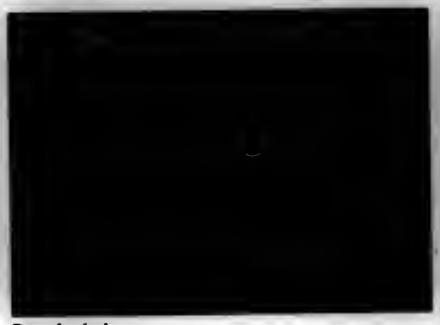
Reporting

Market Research

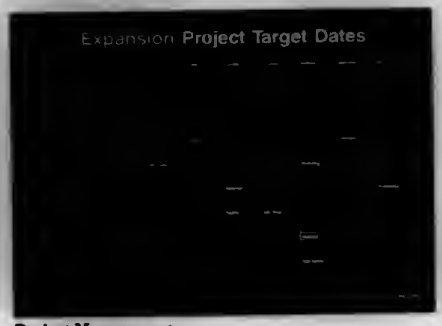


Business Graphs

Visualization



Data Analysis



Project Management

Tools bolster speech recognition applications

By Melinda-Carol Ballou
BOULDER, COLO

Speech Systems, Inc. has released a new version of one of its software packages to help developers build speech recognition applications using some common development tools.

The company is now shipping Version 2.0 of Spot, which offers performance improvements and a range of new features.

Speech Systems' Spot VBX software can be used with Microsoft Corp.'s Visual Basic, and Spot can be used with Visual C++ and Borland International, Inc.'s C++ tools.

Spot and Spot VBX are part of a series of tools that Speech Systems supplies with its software developer's kit for Phonetic Engine 400 (PE 400). PE 400 is a PC-based speech recognition system that is speaker-independent and allows for continuous speech recognition.

Different voices

Speaker independence means PE 400 can recognize words from a variety of people instead of only one person. And rather than requiring discrete, separate utterances, PE 400 uses algorithms that translate speech into phonetic codes (see chart), which are then decoded by a language model that offers a structure for the syntax of the utterance.

The phonetic decoding software parses the data and matches it with its dictionary to establish the meaning of the spoken words. These are then transmitted to the application software.

The Loral Command and Control Systems Division of Loral Aerospace Corp. evaluated the PE 400 system for an application that would run inside a tank.

George Price, senior software engineer at Loral, said the ability of PE 400 to handle continuous speech cut the time to run one application in half.

"We evaluated another card that used voice matching for discrete inputs, and it took us three minutes. With [PE 400], it took us about a minute and a half to enter a message and get it transmitted, which is almost as fast as typing it," he said.

For its part, Lockheed Corp. is using Spot with Visual C++ and Borland's C++ tools to develop a speech application for data entry into a relational database management system and a global information system.

It opted for Speech Systems due to its speaker independence and flexibility. "They use grammar to represent command syntax, which makes it very easy to change commands without having to change code," said Rick Turek, software engineer at Lockheed Missiles and Space Co., a Lockheed subsidiary.

Spot VBX is a custom control tool for Visual Basic that shows up as a tool under Visual Basic and can then be dragged from the Visual Basic tool palette onto the form of the developer's application.

DLL interface

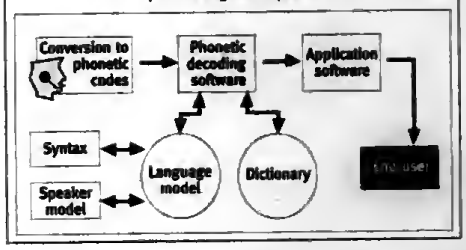
Developers writing applications in C or C++ can use Spot lib, a set of functions for creating speech recognition contexts and properties. The interface to Spot is through Dynamic Link Libraries; it can be used not only with tools such as Visual C++ but also with macros.

The new version of these tools offers pipelining, so Spot begins to decode utterances as soon as they are spoken rather than after the speaker finishes, which increases performance. The new version can also display alternative "decodes," or results to the end user, as well as partially decoded utterances.

The PE 400 developer's kit, which includes Spot and Spot VBX, costs $499 until the end of December, when the price will rise to $999. The PE 400 Speech Recognition System, which includes an analog interface, a converter, two processors and a PC bus interface, sells for $3,400.

Speaking up

Speech Systems promises to make it easier to build Windows-based speech recognition systems

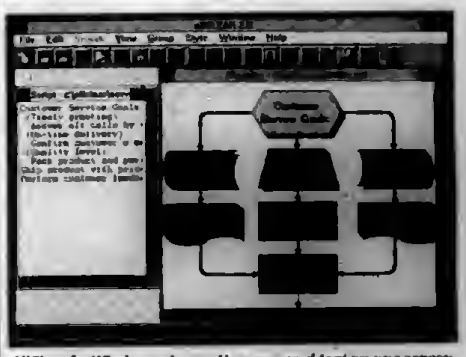


AllClear for charts

By Ed Scannell

Clear Software, Inc. has come up with a Windows-based package that lets users convert written descriptions of business procedures into flowcharts without drawing a single line.

AllClear for Windows works with a wide range of best-selling Windows spreadsheets, word processors and databases such as Lotus Development Corp.'s 1-2-3 for Windows and Microsoft Corp.'s Word for Windows.



AllClear for Windows *shows diagram and text on one screen*

Files from these applications can be transformed into diagrams and exported into Windows applications.

The package allows multiple diagrams to be opened at once. With a split screen, users can edit text on one side of the screen and see the changes in the flowchart on the other side, said Vadim Yasinovsky, president of the Newton, Mass., company.

The Internal Audit Department in the national office of the American Automobile Association (AAA) is using the program to document a range of processes in the organization — for example, to help employees better understand how an insurance claim is processed.

"The program helps us to identify what 'is' so we can compare that to what 'should be,'" said Donald Caniglia, AAA's manager of information security. Caniglia said he has also used AllClear for Windows to document information flows so he can carry out risk assessment of customers.

The program works by translating punctuation marks into specific chart functions. For instance, a period at the end of a line represents a single step, a question mark means a dual choice and a colon means a multiple choice. By following these cues, users can describe a particular process and then convert it to a standard flowchart in a few seconds.

Slated to ship by Oct. 1, AllClear for Windows is list priced at $295 for the standard version; other versions cost more.

Applix framework

CONTINUED FROM PAGE 107

der the ApplixWare umbrella with Extension Language Facility (ELF), Applix's interpretive programming language.

ApplixWare is based on an object-oriented architecture the company has dubbed "information objects." These are any data source relating to the desktop or the enterprise, such as ApplixWare applications, development tools, multimedia information, messaging application programming interfaces (MAPI) and external personal and business applications. This architecture provides user access to data from the desktop.

Underlying ApplixWare is ELF, which allows power users and programmers to customize their ApplixWare applications or to build and deploy their own.

Roy Shilling, a senior research engineer at Arco Exploration and Production Technology, the research and development division of Arco Corp. in Dallas, used ELF to develop custom drilling applications, for example. Dubbed the "drilling calculator," Shilling's group created 55 dialog boxes with complex drilling calculations.

Easier PC integration

Shilling said features available with the new Applix products make it easier to transfer files back and forth between the Unix-based Applix applications and current versions of Microsoft Corp.'s Word and Excel on Windows.

"This gives us better integration with PC users and makes it easy to transfer documents," he said.

The city of Fort Collins, Colo, is using Applix's Asterx for its on-line network operations manual. Users access the applications from either a Unix network or a Novell, Inc. LAN of PCs, according to Bill Roberts, automation and maintenance supervisor.

The following applications are included with the ApplixWare product line: Applix Words, Applix Graphics drawing package, Applix Spreadsheet and ELF. Also included are Applix Mail with support for spell checking, automatic sorting, conversion of incoming messages and shared folders; and Open Mail with X.400 support and filters to and from popular text formats. Options are also available for import/export to WordPerfect Corp.'s WordPerfect, Microsoft's Word, Interleaf, Inc.'s Interleaf and Frame Technology Corp.'s FrameMaker. Applix Data offers links to relational databases from Oracle Corp., Sybase, Inc. and The ASK Group, Inc.

Each member of the ApplixWare product line can be integrated with outside data sources, including MAPIs, multimedia information such as video, audio and images and real-time data feeds from external networks.

Applix Words and Applix Graphics, including ELF, are sold together for $605; Applix Spreadsheet is priced at $495. Applix Data costs $995, Applix Mail $195 and Applix Open Mail $295. Pricing for the optional filter packs is $295 each. These products are shipping now.

Jyacc hopes users will JAM with easier tools

By Melinda-Carol Ballou
NEW YORK

Jyacc, Inc. last week introduced a new version of the company's JAM development tools that brings visual capabilities and ease of use together with object orientation and the ability to manage heavy-duty, transaction-intensive applications, company officials said.

JAM Version 6 is a major rewrite of JAM. Central to the new release is a Visual Object Repository, which stores pictorial representations of application objects, according to Jyacc.

It also stores data elements and their properties and can contain information about how database tables are related, as well as entities such as push buttons and their behavior, procedures and bitmap images, the company said.

With the object repository, developers are able to intuitively build distributed applications — without having to write code — by dragging and dropping visual objects from the repository.

These objects then retain an inheritance link or relationship to their ancestors in the repository. Version 6 supports multiple levels of inheritance, data abstraction and encapsulation.

The new version also offers a Transaction Manager to handle the interaction between an application and one or more back-end databases. JAM defines a default transaction model that defines the optimal processing behavior for that database management system.

JAM also lets developers modify those models to globally affect application behavior. In this way, developers can attach user hooks to override the model or code their own database access.

JAM Version 6 offers an icon and menu-bar graphical editor, a debugger, a SQL-based, flat-file manager and the Visual Object Repository. It also offers support for development in character mode.

JAM Version 6 is slated to be available by year's end starting at $2,000.

Wang sets Pace

CONTINUED FROM PAGE 107

look if Informix support were added.

"Pace is pretty friendly," said Jung, who continues to use the VS version of the Wang software. "The question would be, how does it stack up against [other tools], both in development capabilities and resource usage?"

However, the new strategy comes too late in the game for Ramsay Millar, director of MIS at the British Columbia Tourism and Culture Department in Victoria, British Columbia, and former chairman of the Americas Pace Special interest Group. "That's a great idea, but unfortunately it's too little, too late," said Millar, who unplugged most of his VS systems this year.

Resellers required

Wang is trying to sign up resellers to handle marketing of the ODBC-compliant release of its query tool. The company will do some direct sales of the product, "but the real thrust will be in alternate channels," said Neil Enter, director of open software marketing at Wang. The software will use a Windows-based GUI and support the merging of queried data into word processing documents, he noted.

Analysts had mixed outlooks on Wang's ability to sell Pace beyond its installed base. "They've got a really nice tool," said Bruce Silver, a vice president at BIS Strategic Decisions, a Norwell, Mass., consultancy. "If people give it a fair look, it will be interesting."

Rich Finkelstein, president of Performance Computing, Inc., a consulting firm in Chicago, was more skeptical. "The market is already saturated, and this kind of metamorphosis usually doesn't work well," he said. "It's hard to unhook" tools that were designed for a specific database, he said.

AT 9 A.M. HE DIDN'T KNOW HOW TO WORK WITH A DATABASE.

When Don Glor came to work on the morning of September 15th he'd never used a database before. Two hours later he'd developed his first application — it looks like a fire truck, actually it's a customized inventory and billing management system for the South County Fire Department, San Mateo County CA.

Don was using Lotus® Approach™—the only database designed for fire fighters. And lawyers and doctors and business people. And anyone who isn't necessarily a computer expert.

Approach lets you get to work right away in familiar, easy to understand desktop items. You can generate reports, forms or form letters – you can even print mailing labels to match any specification.

INTRODUCING APPROACH 2.1. THE RELATIONAL DATABASE ANYONE CAN RELATE TO.

All the power and functionality in the world is no good if you can't use it. Approach is expressly designed to be easy. There's no programming to learn. No endless documentation to study. And according to independent research, "The average Approach user produces real results with their database in 2 hours."

This will surprise anyone who has tried to work with databases like Paradox® or Access®. According to Don, "I tried Access and shelved it. It was just too difficult to get a handle on." That's not surprising considering the 543 page supplemental language reference for programmers Don would've had to pore through. Which looks like light reading next to Paradox's 1300 pages of programming instruction.

The difference is that their products were not designed for general business users.

With Approach you have database power that really is accessible, and you work in one of four familiar, desktop items — reports, forms, mailing labels or form letters — that look and work just like you expect them to, to help you be productive right out of the box.

Approach has won over 25 major industry awards and accolades.

The Alsys CASE Division has announced TeleUse/DB 1.0, a graphical user interface (GUI) builder that enables developers to create the Open Software Foundation's Motif GUIs for database applications.

According to the San Diego company, TeleUse/DB 1.0 provides 100% Motif widget support, which allows simultaneous support of interfaces for multiple databases when used with the TeleUse User Interface Management System. The migration path permits advanced functionality, such as dialog management, graphics and custom widget support. TeleUse is available for Sun Microsystems, Inc.'s SPARCsystems running SunOS 4.1.2 and Sybase, Inc.'s Release 4.9.2.

A single-user license costs $1,990.

▶ *The Alsys CASE Division*
(619) 457-2700

Persistence Software, Inc. has announced Persistence 1.4, a development tool designed for building object-oriented applications that transparently access data in relational databases.

Support is provided on Hewlett-Packard Co.'s Precision Architecture-RISC workstations and Sun Microsystems, Inc.'s workstations.

According to the San Mateo, Calif., company, Persistence employs an object model as input and can automatically generate C++ classes for interfacing with relational databases similar to the code that is generated by tools for constructing graphical user interfaces.

A developer's license costs $14,995, and software support is priced at $2,995.

▶ *Persistence Software*
(415) 341-7733

Sign-On Systems, Inc. has introduced Sign-On For Fox, a FoxPro Pen Interface library for Windows for Pen Computing.

The product includes more than 100 functions that interface directly within the Windows for Pen application programming interface, according to the Beverly Hills, Calif., company.

At the field level, programmers can change directories and recognizers and turn handwriting recognition on and off.

Sign-On For Fox costs $495.

▶ *Sign-On Systems*
(310) 274-7477

Michaels, Ross & Cole Ltd. (MRC) has introduced its external objects feature in Release 4.0 of the MRC-Productivity Series.

According to the Lombard, Ill., company, the product empowers end users and programmers to define virtually any non-MRC program or routine as an external "object," grab the object and seamlessly execute it from within an MRC application or report.

Users can access multiple layers of information from disparate databases by building their own drill-down applications with the product.

Prices range from $4,000 to $69,500.

▶ *Michaels, Ross & Cole*
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Product shorts

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INVASION OF THE BODY PATCHERS

No longer just working stiffs, contract programmers are helping to train permanent IS staffs in new technologies

By Julia King

Paramount Pictures Corp. is casting contract players. But these hired hands aren't the usual hit players — they're cast in pivotal programming roles.

"There's a wave of new technologies that's accelerating, and we don't have people trained and ready to go now to do new or pilot projects," says Edward Altman, Paramount's executive director of systems development.

To bridge the gap, Altman hires outside contractors, who in total make up 25% to 33% of Paramount's 100-person information systems development team.

Using contractors is by no means new, of course. IS managers have long hired so-called "rent-a-programmers" from "body shops," the agencies that specialize in providing temporary IS personnel.

What *is* new, however, is how contractors are used. Instead of hiring contractors to save money or help them cope when shorthanded, many IS managers increasingly use contractors to train permanent staff in new technologies and to build new applications that use these technologies.

That makes the recasting of IS at Paramount more the rule than the exception, according to Neal Hill, a senior analyst at Forrester Research, Inc. in Cambridge, Mass.

According to a Forrester Research study, almost three-fourths of in-house IS professionals simply don't have the expertise in the new technologies their companies want to deploy. Outside contractors were used at 63% of the companies in a wide range of industries Forrester surveyed.

"As technology curves move faster and faster, IS departments simply can't expect to capture and nurture all the skills they need in-house," Hill explains. "More than ever, new technologies are being injected into companies by outside service providers."

In greatest demand are contractors skilled in distributed LAN-based technologies, computer-aided software engineering and Unix. Object-oriented programming expertise and client/server development methodologies are also widely sought, says Neal Grunstra, president of Mind Bank Consulting Group, Inc. in Vienna, Va., which provides senior information technology professionals to large companies. Other providers of contractors with leading-edge skills, such as Valinor, Inc. in Manchester, N.H., report growing demand for different combinations of skills.

Contractors, *page 116*

Alan Levenson

Southern California Gas' Ed Trainor: *'There's not much economic difference in the cost of contractors vs. employees.... With the benefits and overhead associated with the employee, the costs even out.'*

King is a free-lance technology writer in Ridley Park, Pa.

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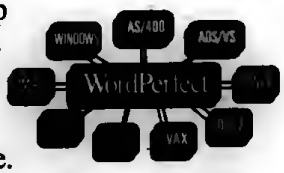

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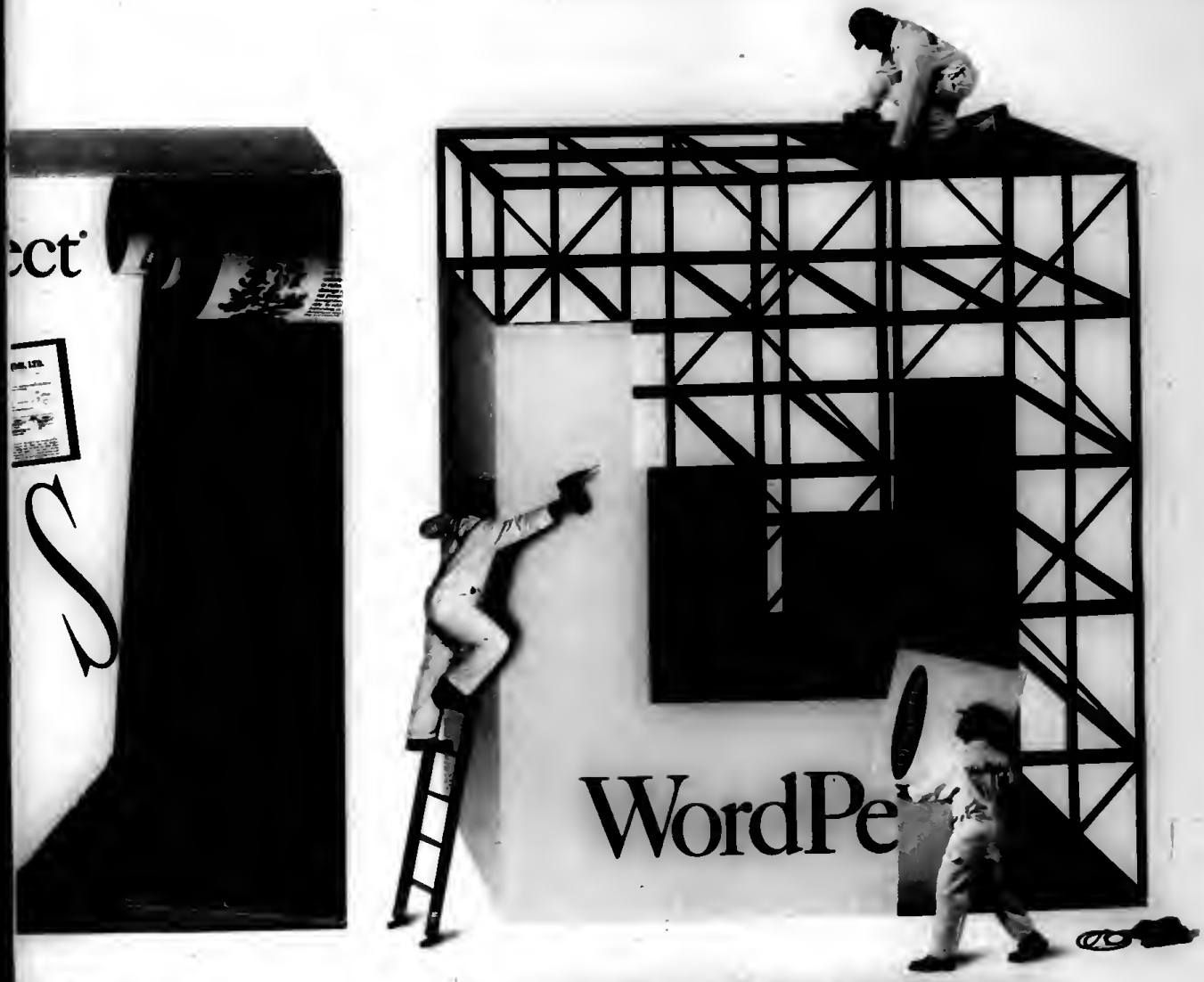

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Contractors

CONTINUED FROM PAGE 113

But because most companies implement several new technologies simultaneously, finding contractors with unique combinations of cutting-edge skills is not easy. Agencies that can provide these services have grown rapidly. Mind Bank, for example, earned $2.8 million from contractor placement in 1991 and expects to hit $7 million this year, Grunstra says.

Valinor reports that its earnings from software development services alone have doubled in two years.

Applications experts

"I see contractors being used more and more for quick-strike application development," observes Rich Murray, a Los Angeles-based principal at Nolan, Norton & Co., an information technology consultancy based in Boston.

"In the 1970s and '80s," Murray says, "contractors were hired to come in and write Cobol code. Now many are doing very targeted development on specific systems like sales force automation."

Paramount is a good example of a company that uses contractors to keep applications development moving. Caught in a technological squeeze as it evolves from mainframe and minicomputers to network-based client/server systems, Paramount sorely needs programmers experienced in mainframe database and transaction-processing systems. It also needs experts who can develop pilot applications that incorporate distributed technologies like IBM's OS/2 operating system, Novell, Inc.'s NetWare network operating system and Sybase, Inc.'s relational database.

Bose's Tom Charbonneau: *'Employees cannot retrain in newer technologies plus maintain legacy systems at the same time. Neither can contractors.'*

If computer professionals skilled in both established and emerging technologies were readily available, Altman says he'd grab as many as he could.

But like most cost-conscious corporations, "Paramount is loath to hire additional staff," Altman says — especially in view of Paramount's pending merger with Viacom, Inc. "We also don't know if the pilots will survive and what our specific long-term needs will be, so it's not worth a massive in-house training effort today."

Contractors provide a way to build pilots based on new technologies without investing permanent staff in high-risk projects.

Beyond a demand for those skills, however, is the growing expectation of IS managers that contractors provide on-the-job training in technologies to in-house employees.

"IS is definitely looking for skills transfer. One of the requirements in many of today's contracts is that contractors make in-house employees smart while building new systems," Hill says.

Contractors are also hired as outsiders by corporations to back-fill positions temporarily vacated by employees sent off-site for training in advanced technologies, Nolan, Norton's Murray says.

"It's just like retooling a factory," says Alan Ditchfield, chief information officer at The Progressive Corp. in Mayfield Heights, Ohio. "You send the regular person out to retrain and a contractor handles things until he gets back." Currently, contractors compose 10% of Progressive's 270-person programming work force, Ditchfield reports.

Overseas savings

Some IS managers who seek to cut personnel costs are using overseas contractors.

Robert Menar, a senior vice president who heads the information services division of Carter Hawley Hale Stores, Inc. in Los Angeles, already knows the savings that using overseas IS expertise can yield. Mainframe CICS programmers in Beijing recently built an entirely new system for the company's catalog mail-order operation in less than six months.

"They're outstanding," Menar says of the Chinese programmers with whom in-house IS personnel exchanged system specifications and code via electronic mail. "They produce quality code, and you can buy these programmers for $22 an hour, which is unbeatable."

Menar and other IS managers peg the hourly rate of U.S. contractors at between $40 and $60.

Juggling employees and IS contractors

Contractors are making bigger-than-ever contributions to IS departments. But their growing importance creates difficult management issues. Just for starters:

- Whom do you entrust with supporting critical applications that still reside on the mainframe?
- Who is best-suited to work on new development projects?
- How will giving development to contractors affect employee morale?

IS managers who use contractors must make a choice: Use either new or old technology, not both.

"Employees cannot retrain in newer technologies plus maintain legacy systems at the same time. Neither can contractors," says Tom Charbonneau, manager of corporate IS and business administration at Bose Corp. in Framingham, Mass.

Under the gun to get new distributed systems out the door fast, IS management must decide which group is best-qualified to each set of tasks and then "strike a careful balance between the skills and knowledge of both groups," Charbonneau says. "There's no question that it's difficult to manage two different types of people."

Employees concerned about job security are naturally apprehensive about turning over any work, especially new development, to outsiders. Contractors, meanwhile, have little native knowledge of legacy systems. That makes outsiders an illogical choice as enstodians of mainframe-based applications.

However, "employees with a long-term relationship with the company get nervous if they get pushed into maintenance and see contractors getting to work on what they consider the good stuff," Charbonneau says. "There's also the worry that if a contractor leaves without properly training employees, you're stuck."

Charbouneau's solution: Assign all contractors some maintenance responsibilities. He also earmarks 30% of all IS employees' time on the job for retraining.

"We're using contractors to do Unix and client/server development, and it always crops up that employees will be uneasy," he says. "You have to reassure employees that they're not being left in the dust. You have to manage that as a person. That means meeting with employees and explaining what's going on."

At Southern California Gas, vice president of IS Ed Trainor is using a combination of training and financial incentives to keep up employee morale during the transition from mainframe to client/server systems.

Currently, the gas company's 500-person IS department relies heavily on contractors for developing client/server applications. About 100 IS contractors work there. But, as Trainor sees it, the company still has a duty to retrain IS employees in emerging technologies, even though it plans to cut staff once these

TIPS FOR MANAGING CONTRACTOR TALENT

- Plan ahead. Finding contract developers with the unique combination of skills you need will take time and research.
- Require both independents and those who work for agencies to sign an agreement setting forth their exact relationship with your company, specific work requirements and deliverables and the conditions under which they can be terminated.
- Process payments via purchase orders, which can be tracked through the accounting process.
- Pay by the project rather than an hourly or weekly rate.
- Set forth in writing specific expectations regarding training of in-house employees.
- Delegate responsibility for overseeing skills transfer to a particular employee project manager.
- Familiarize yourself with IRS guidelines concerning workers' status.

Yet in these days of buckling IS budgets, many IS managers don't seem to be troubled by the fees they are charged by the agencies that supply contractors.

Many managers regard the flexibility to engage technology-savvy contractors on an as-needed basis well worth the premium hourly rates they pay for them.

"You typically look at costs over the life cycle — a year's salary plus benefits vs. the cost of the project," says Gary Senese, vice president for MIS at Rubbermaid Commercial Products, Inc. in Winchester, Va.

When you calculate costs this way, Senese says, "The per-hour costs are probably similar. The biggest thing I get as a manager is flexibility to add and subtract resources as needed.

"The idea," he says, "is to spend money wisely and maximize your return. You can always buy cheap, but this is not the primary motivator for using contractors. My goal is to get the most productivity out of the dollars spent on IS."

Contractors vs. employees

Still other managers say that higher hourly rates don't necessarily translate into higher costs.

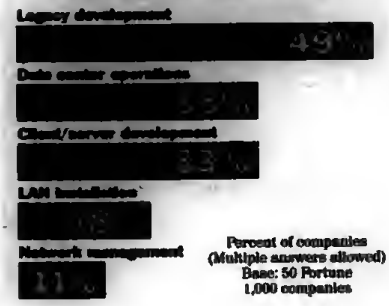
Once the cost of fringe benefits, payroll taxes and other expenses associated with employees are figured in, contractors cost about the same, or sometimes even less, than employees, they say. In the long run, hiring contractors may even be more cost-effective than hiring full-time employees.

"There's not much economic difference in the cost of contractors vs. employees. You may be bringing in an employee at $50,000 a year and a contractor at $100,000, but with the benefits and overhead associated with the employee, the costs even out," says Ed Trainor, vice president of IS at Southern California Gas Co.

"The employee has jury duty, maternity leave and training, and due to all of these things, employees are between 75% and 80% productive," Trainor says.

"Contractors are only paid when they are working. When you do the arithmetic, there's not much difference. They're relatively substitutable." ■

WHAT ARE YOU USING CONTRACTORS FOR?



Percent of companies (Multiple answers allowed) Base: 50 Fortune 1,000 companies

Source: Forrester Research, Inc., Cambridge, Mass.

technologies are fully deployed.

"If we left our employees to work only in the existing environment, they wouldn't be skilled at cutover time, and we felt it was our obligation to give them a chance to be competitive," he says. "The other option would have been to downsize now and try to guess who would be competitive and who wouldn't a year from now. Frankly, our crystal ball just isn't that good."

So, for the time being, the gas company keeps all its staffers. Moreover, to sustain their morale, the company financially rewards those assigned to maintain the legacy applications they know will be put out to pasture.

Trainor says the company is also exploring the possibility of permanently contracting this type of maintenance to overseas programmers. "We already know what the potential [for savings] might be and it's really quite large, large enough to warrant the next level of study," he says.

Motivating factors

But paying contractors is one thing; motivating them to produce consistently high-quality work is quite another. And it's an issue IS managers should consider. After all, managers don't have to worry about paving contractors' path to the top of their profession.

Indeed, outsiders' career concerns, unlike those of employees, are of little interest to the IS managers who hire them.

"Frankly, I'm not all that concerned about [contractors'] careers. That's one of the things you get a lot colder about," says a systems development manager at a $1 billion specialty clothing company who requested anonymity. "If you need them to go program, you tell them to program and you let their [agency] management worry about their careers."

Progressive's CIO, Alan Ditchfield, is equally blunt on the issue. "If a contractor isn't motivated, you get rid of him."

Different incentives

On the other hand, what managers give up with contractors is the power to use performance review as an incentive, notes Gary Senese, vice president of MIS at Rubbermaid Commercial Products. Rubbermaid's 10 IS employees serve as project managers in charge of an ever-shifting population of specialized contractors.

"One of the first challenges for in-house project managers is learning how to manage contractors who aren't part of the team and who don't have the same incentives as they themselves do," Senese says. "There's a different set of management skills necessary, and we're still learning how to do this." — *Julia King*

Who's a contractor? IRS cracks down

If you're interested in hiring contractors, the Internal Revenue Service is interested, too. And the agency is cracking down on companies that misclassify contractors.

Robin Mattern, a contract programmer who has worked for the same client every day for two years, is exactly the kind of worker that has piqued the interest of the IRS.

The agency's 5-year-old Employee Tax Examinations (ETE) unit specializes in investigating contract workers and the companies that hire them. The unit's goal, IRS spokesman Don Roberts says, "is not to declare war on independent contractors but rather to make sure that people who are employees are treated as such. Misclassifying employees as contractors puts workers at a disadvantage and employers at an unfair competitive advantage."

For companies such as Mattern's current employer, an advantage of hiring contractors is the huge savings that can accrue in payroll and other taxes, none of which applies to contractors.

Companies whose labor force consists entirely of employees, on the other hand, are required to pay not only income taxes but also Social Security and workers' compensation insurance.

Since ETE's inception, the IRS has snared more and more companies that have taken the contractor shortcut.

IRS CHECK

To receive information on contractor status check (800) TAX-FORM

Ask for Publication 937, titled "Employee Taxes and Information Returns"

Thousands reclassified

The agency says that in fiscal 1992, ETE reclassified 90,000 independent contractors as employees. During that year, Roberts says, the IRS disposed of 1,700 cases. Another 9,000 cases were closed without the IRS' opening an audit. In many cases, he says, companies agree with the IRS auditors' findings, and only a "small amount" of cases are contested.

One contested case concerned Mind Bank Consulting Group, which provides high-level IS professionals on a short-term basis to Fortune 1,000 companies.

Mind Bank President Neal Grunstra says the IRS audited his company four years ago on the contractor/employee issue, wanting to reclassify 33 workers and collect $250,000 in fines and back taxes. Grunstra says his company appealed the case and won.

Managers concerned about the status of people working for them can allay their doubts by consulting IRS guidelines. The IRS offers a 20-point checklist that it uses internally to resolve employment status disputes.

Checklist topics range from the kinds of equipment or tools a company provides a worker to the location of the work site to how a worker is compensated.

For example, employees, rather than contractors, usually work on company premises or at a location designated by a company, according to the IRS. Also, employees usually work during hours specified by an employer. Independent contractors, on the other hand, generally set their own hours, according to the guidelines.

The checklist is available by telephoning (800) TAX-FORM and requesting IRS Publication No. 937, titled "Employee Taxes and Information Returns."

Take precautions

In addition to familiarizing themselves with the IRS guidelines, companies should take additional steps to protect against run-ins with the IRS, advises IS manager Tom Charbonneau at Bose Corp. in Framingham, Mass. His recommendations include the following:

- Hire contractors only through contracting agencies, which are responsible for paying all appropriate taxes.
- Require every contractor to sign an agreement that details the exact relationship between worker and company and spells out work requirements and deliverables.
- Process contractor payments via purchase orders rather check requests.

"You also need to be very careful about providing contractors with space because this could be construed by the IRS that they are employees," Charbonneau warns. "Preferably, you want contractors to work off site and check in with you."

At Southern California Gas, Vice President of IS Ed Trainor hires contractors only through agencies. Independents, he says, place companies at a higher risk to IRS exposure.

"You may be preparing a[n] [IRS form] 1099 for a contractor, who in turn may not be paying taxes," Trainor says. "The IRS then applies its employee-vs.-contractor test, and it's theoretically possible that a contractor could claim that they were actually an employee. For that reason alone, we bring in contractors only through agencies."

— *Julia King*

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Games integrators play

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WILLIAM MCLEOD

The Harper Group's Ron Finlason recommended that his air freight firm reject an integrator's sky-high bid and tackle most of the re-engineering work itself

When Ron Finlason took a look at the bid in front of him, he did some quick arithmetic and decided his company didn't need a Big 5 accounting firm to do what it could do for itself at 35% to 40% less.

By Abby Christopher

Finlason's company, The Harper Group, was on the verge of hiring the consulting and systems integration subsidiary of a national accounting firm for a very large project, when he appeared on the scene. The firm had been on-site for about six months already conducting a needs assessment and analysis. When a recommendation was finally produced, executives at the San Francisco freight and import/export company realized they weren't qualified to judge its merits. That's one of the things they hired Finlason to do — oversee integration and re-engineering efforts and interpret the recommendations of big-ticket integrators.

Finlason's interpretation was simple: way too much markup.

"The problem I had with their bid and the others we got was their billing model, their overhead," he says. "A big chunk of their bid included $80 to $90 an hour for the 'grunts' who were going to do the basic code. But the going rate for that kind of work is $50 to $60 an hour."

Games, *page 122*

Games

CONTINUED FROM PAGE 121

Based on Finlason's recommendation, The Harper Group decided to do the bulk of the work itself, including linking seven disparate freight-tracking systems located at offices around the world. When outside help is needed, the company hires systems analysts and programmers on an as-needed basis for $50 to $60 an hour.

Do-it-yourself is not an option for many companies, and it wouldn't be appropriate in a lot of circumstances, but many companies that work with systems integrators say it's a relationship fraught with danger for the unwary and naive. You have to know exactly what you need, negotiate hard to get it, and keep your eyes open through the whole process.

Some of the most bitter complaints about integrators have nothing to do with the size of their bills. What customers and industry experts peg as the biggest problems are inflated claims of expertise in their business or industry, boasts of technical know-how that turn out to be illusory and bait and switch tactics that leave you without the promised technical talent.

"We know your business"

For the most part, systems integrators are not trying to deceive you, but face it: They want to sell you a service, and sometimes selling means applying a little can-doism. It's up to you to probe backgrounds, ask hard questions and, if the integrator seems ideal in every way but this, write the contract so they, not you, bear the cost of their education.

That's exactly what KFC Corp. and Taco Bell, two of Pepsico, Inc.'s fast food businesses, did when they decided to hire Ottawa-based SHL Systemhouse, Inc. to design a point-of-sale (POS) system for their restaurants in North America. SHL Systemhouse had no particular background in the fast food industry.

Peter Zaretz/Black Star

Bill Soper
Chevron Canada

Staff changes can cost you time.

But as Audrey Broska, strategic consultant to the information technology group at Taco Bell and project executive on the POS job, says, the firm did have other important attributes: a worldwide organization to support the companies' interest in global POS development and expertise in open systems and object-oriented design. Solution: stipulate up front that the integrator must learn the fast food business at its own expense.

According to Michelle Wells, systems development manager at KFC, members of the SHL Systemhouse team have become a familiar sight at KFC's research and development restaurants, where they do the jobs they are trying to automate and integrate.

SHL Systemhouse hands have also put in time inventorying food and restaurant supplies, making tacos, taking orders and ringing up sales at Taco Bell restaurants in Southern California. This on-site labor was a specific stipulation of the agreement, as was SHL Systemhouse's hiring of a quick service consultant for lessons in fast food business, Broska says.

"If you don't know what it's like to have 50 high school kids in front of you in the restaurant, you don't know how to design the systems [to] be intuitive," she says.

Live experience with the work process and the environment cannot be overvalued, says John Parkinson, a managing partner at Ernst & Young. Parkinson says there are several financial institu-

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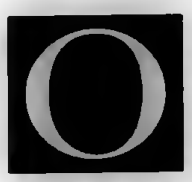
The games *you* play



By Susan Scrupski

OK, now that you've heard all about the problems you want to avoid, you may be thinking that, as a group, systems integrators are a) incompetent b) arrogant c) sharks or d) all of the above.

If any of those were accurate descriptions of even a sizable segment of integrators, this service category would be headed toward extinction instead of growing by double digits every year.

Integrators don't deny projects can run into problems — sometimes big ones — but they do maintain that customers have to assume part of the blame. Integrators insist that on many projects, they are placed in impossible situations that guarantee failure. In those situations, they say it's the customer — not the integrator — that sabotages the project and often the relationship.

Charity called for

The biggest stumbling block, integrators agree, can be a client's failure to formulate clear business goals. "The person asking for the integration must explain the business objectives," says Peter Abene, director of corporate marketing at Electronic Data Systems Corp. This means not only the basics of what you want to accomplish, he says, but also a full description of the environment in which the system will be used.

Abene gives an example of an integrator that has met all the technical specifications in a contract only to discover, after the project's completion, that end users had expected laptops, not desktop PCs. "If that kind of information didn't get carried through into the technical specifications, [then] you didn't meet the business objectives, and the project could be considered a failure," he says.

Customers also frequently discount the training that will be required to take advantage of a new system, Abene says.

A related problem, integrators say, is customers' failure to understand that, at some point, planning must end in a firm commitment to specifications. A poorly defined scope is "a major roadblock," according to Doug Catalano, president at CSC Partners. "You're asked to do a job that is reasonably specific, and during the deployment state, the client begins to ask for more functionality."

Doug Catalano
CSC Partners

The time to ask for more functionality is not when the system is ready to be deployed.

This kind of back-end loading of extra requests is more than a nuisance; it has big cost implications and can poison a good relationship. Michael Drury, Hewlett-Packard Co.'s project services manager at the company's professional services organization, explains. "It's particularly difficult when the client doesn't agree that what they are requesting is a change in scope but contend it is 'clarification' of things." What the client doesn't realize, he says, is that a 10-minute software rewrite can affect countless other tasks in the project.

Peter Abene
EDS

Customers sometimes leave out important details, such as the fact that end users are expecting laptops, not desktop systems.

One thing customers definitely should tell integrators but often don't, they say, is exactly what the political stakes are. "Too many times, a project is sold [internally] like a product," says Vince Chickillo, marketing operations manager at Digital Equipment Corp. People aren't cognizant of how deep the trouble can go if everyone involved isn't fully apprised of what's at stake, he says.

On a related note, the people who will actually be using the system are often not mentioned — and sometimes not even consulted — about what they want and need. Chickillo says that if the decision maker is different from the end user, trouble often follows.

"Sometimes [the end users] have no clue; they're not even asked to participate," he says. In fact, according to Dennis McGuire, a consultant who regularly advises clients on integration contracts, "The No. 1 problem [when contracts run awry] is when users do not adequately support the project."

Another sure project killer is inadequate staff resources on the customer side, Drury says. "You're always dependent to some extent on the client's resources, even if it's just to ask questions," he notes. "But it's often the case that they're too busy to help you with a project they committed to." ■

Scrupski is president of SS Consulting and editor of the newsletter "The Integrator," based in Barnegat, N.J.

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Games

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tions that would be a lot better off today if they had done what KFC and Taco Bell are doing. These financial powerhouses "sunk hundreds of millions of dollars into systems integration projects, only to wind up scrapping them." How could that happen? In most cases, Parkinson says, the problem isn't the technology but the fact that the end result just wasn't suitable for the business environment.

"We have tech talent"

If you hear that line, you owe it to yourself to swallow it with a grain of salt. Mike Corey, vice president at Database Technologies, a Sudbury, Mass., consultancy, says technical virtuosos are spread pretty thin across the industry these days. "Even the biggest systems integrators are scrambling for talent," he says.

Limitations are particularly pronounced in terms of experience with new software and development tools. Preliminary screening of potential contractors is crucial. In fact, many firms are starting to interview each member of an integrator's proposed team as if each were a prospective employee. Others are suggesting that integrators let their team members learn new tools on their sites — before the meter starts running.

That was the gist of an agreement Kaiser Permanente, a health care firm in Oakland, Calif., struck with the integrator it hired for a multimillion-dollar, four-year, payroll/personnel project.

"We hired them under very specific conditions," says Barbara Beck, manager of systems development at Kaiser. "They had a one- to two-week grace period to learn the technology needed for the systems design and development. We didn't pay the staff that worked on the project until they were up to speed."

"We're here to stay"

Frequently, customers say, the integration team you start with — or think you're starting with — is not the one you wind up with.

Staff switches are most common on longer, more complex projects. Partway through, experienced contract staffers may be replaced with less seasoned workers. This slows down completion of a project. Right now, Bill Soper, MIS manager at Chevron Canada Ltd., is concerned about hanging on to the

Games, *page 128*

KFC's Michelle Wells: Integrators were put to work behind the counter, performing the very POS tasks they were hired to automate and integrate

Survival tips

By Vicki Hudson

Almost every IS professional has at least one systems integration war story. Most of us have several.

After the dust has settled and the consultants have departed, project processes are reviewed to figure out where things began to slip. Invariably, that question leads back to the beginning of the project, to the point where confusion was first sown and IS loosened its grip and stopped actively managing the process.

Based on many projects I've watched and a few I've experienced, I see a pattern to the way in which projects go wrong. What follows is a composite of the most common mistakes.

Our task is to replace almost half of the existing business applications, which cut across nearly every department. This is the largest IS effort attempted in several years.

Before any decisions are made, lengthy discussions are held, and an attempt is made to plan for every contingency. Inevitably, however, things are missed and misunderstood.

The software that is purchased meets requirements and is clearly the best choice in terms of price and functionality. The vendor is available and willing to make any necessary alterations. The problem is, the firm is small and unaccustomed to working with an organization as large as ours. It will clearly need a lot of help.

How to keep the boat afloat

- Define your expectations in writing.
- Invest in project and contingency planning.
- Recognize that you, not the integrator, own the problem you're trying to solve.
- Believe what is written and nothing more.
- Don't assume the integrator can figure out your culture, organization and existing applications. Involve as many of your people as possible — IS staffers and end users.
- Apply quality and project management procedures – task tracking, change management, etc. – from Day 1.
- Don't assume the staff involved in the sales effort will be the same staff assigned to your project.
- Take the time to review deliverables periodically and to make sure you know how end users think things are progressing.

A reputable, experienced consulting group is selected to oversee the project. It vows to assemble the best possible team quickly and assures us that this team will be flexible in its approach to our problem. Our IS group relaxes and decides that the project is in safe hands.

Several internal staffers are assigned to the team but only part-time. Their skills are required to keep the existing systems running.

Little documentation exists on the business processes and applications in existence, and no serious attempt to create it has been made, which leads to underestimation of the scope of changes and makes effective management of organizational change impossible.

Because the goal is to change the business, a heavy commitment of time and effort is required from users, but little attention is paid to selling the idea of the project and participation in it throughout the organization. No one really has a clear view of how much this will all take.

The consultants move in and begin asking questions — more questions, requiring more time than anyone has really anticipated.

The users, who have never been involved in a systems development effort before, receive little guidance in project management or normal development processes. This will mean modifications after the system is put into production.

Managing the number of changes deemed critical becomes an awesome task, and the software vendor can't keep pace. The quality of the delivered software suffers. Acceptance testing becomes a major responsibility.

Staff changes, technology issues and philosophical differences among the consultants, the vendor and the internal staff cause delays that impact both the schedule and the final product. The job gets done, but no one will call it a success. ■

Hudson is director of technology planning and management at The U.S. Shoe Corp. in Cincinnati.

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Who's who

If you want to hire an integrator, don't worry about limited selection. There's a mind-boggling variety of players competing for this kind of business right now. In fact, your biggest problem is going to be sorting out the options.

To help you cut through the confusion, we've identified the major types of providers and some of their strengths and weaknesses. We've also included examples of companies that fit these categories. Here's how they sort out:

▶ MANAGEMENT CONSULTING FIRMS
These are business consultants with considerable industry and "process" expertise. Lean toward these firms if you're in the market for strategic business process rethinking. But proceed with caution: One recent study by International Data Corp. reports that these firms are sometimes far less technically capable than they would lead you to believe. Exceptions here might be companies such as CSC Index, Inc. (which can lay as much claim to the re-engineering movement as Michael Hammer) and Booz Allen & Hamilton, Inc., which has its own commercial information systems group.

Examples: McKinsey & Co., Boston Consulting Group, Bain & Co., Monitor Co., Arthur D. Little, Inc.

▶ LARGE ACCOUNTING FIRMS
In this instance, you might think of these as the Big 5, as Andersen Consulting has moved so far from its accounting roots. The information technology practices of large accounting firms have impressive technical credentials and a generous number of high-profile accounts. Most of these firms have specialties in emerging technologies and an understanding of how to apply them to industry-specific business processes.

Examples: Ernst & Young, Coopers & Lybrand, Price Waterhouse, KPMG Peat Marwick, Deloitte & Touche.

▶ LARGE MULTISERVICE FIRMS
These companies represent your classic systems integrators: large (more than a billion in revenue), independent firms that provide a full spectrum of services, from strategic consulting and business process re-engineering to facilities management, sometimes through a variety of divisions or subsidiaries. For example, Computer Sciences Corp. provides management consulting through CSC Index, systems integration through CSC Partners and large-scale commercial facilities management contracts through its Industry Services Group. The greatest advantage in working with a large, well-known company is the low risk of default on contract commitments.

Examples: Electronic Data Systems Corp., CSC Index, Integrated Systems Solutions Corp., Andersen Consulting.

▶ SMALL MULTISERVICE FIRMS
There is less diversity among the smaller services providers. These companies will offer a full suite of services but often specialize in one area. One advantage in working with small firms is that management will respond quickly to client requests and will generally commit more senior people to projects. Many of the companies in this category will be in the big leagues in a few years.

Examples: Technology Solutions Corp., Perot Systems Corp., SHL Systemhouse, Inc., American Management Systems, Inc., Logica NA.

▶ SMALL NICHE/BOUTIQUE FIRMS
The hottest emerging integrators in the market today are found in this category. Whether it's client/server migration, object-oriented application development, wireless LAN solutions, computer-aided software engineering or imaging technology, these firms generally carve out specialized niches. This group has some of the best expertise in emerging technologies and is usually quite good at transferring these skills to customers' staffs.

Examples: BSG, Innovative Information Systems, Inc., Lante Corp., Trident Systems, Inc., Fiserv, Inc.

▶ NETWORK COMMUNICATIONS VENDORS
If it is an advanced enterprisewide network you're after, communications vendors are well-positioned to help you build and manage intelligent and expandable connections. Advantages include good technical credentials and a grasp of data, voice and video communications.

Examples: AT&T, MCI Communications Corp., Sprint Corp., WilTel, Advantis, Syncordia, the regional Bell operating companies.

▶ SYSTEMS AND SOFTWARE VENDORS
A staggering number of product manufacturers are starting up independent integration and services organizations. The extent of bias toward the vendor's own products varies. Some companies candidly position their consulting arms as inclined to use their own products, while others seek true independence. Most do lean, to some degree, toward their parent's offerings. Using a vendor's systems integration unit can make a lot of sense if you have a substantial investment in it. You may even find that it will work harder to please so it doesn't lose your systems business.

Examples: IBM, Digital Equipment Corp., HP Professional Services Organization, Oracle Consulting, Microsoft Consulting Services, Lotus Consulting.

▶ NETWORK INTEGRATORS
This group contains a couple of subcategories. The bigger segment is LAN resellers offering network integration services. Complex LAN-to-LAN networking is their primary focus, although many also handle multiplatform networking, groupware and client/server application development.

The second type, which goes by the name of network systems integrator, is something of a hybrid. Typically, such a firm is comfortable in network technology but goes beyond that to provide project management and ongoing support of complex, inter-LAN networks.

Examples of Type 1: USConnect, LANSystems, Inc., Data Systems Network Corp., Network Management, Inc., The Asset Group. Type 2: Syntrex Technologies, Inc. ■

—Susan Scrupski

Games

CONTINUED FROM PAGE 125

team that's been working with him for two years on a $7 million order entry and gas delivery system, due to be completed in four years. "Changing staff can cost you months of productivity," he says. It can take three to six months, depending on the project, to orient new integration staff, Soper says. Chevron estimates that this can actually cost upward of $6,000 a month.

Soper says he is hopeful he'll be able to retain most of the top integration staffers because "it is a good, high-visibility job, a good reference account that will help them get more work." Still, he says, in the future he'll stipulate staff tenure at the outset.

However, writing rules into the contract may not make a lot of difference. Beck has tried writing contract terms focused on keeping specific people and laying down rules for staff replacements but says this "continues to be a common hazard for any long project."

"We know what's best"

The best protection against a bad experience with an integrator is knowledge of what's needed, the going rates for services, the kinds of technologies that could be applied and how to assess the quality of deliverables.

Some firms use consultants to interpret and evaluate what integrators are proposing and doing. Others hire or appoint a permanent employee to do it. In either case, the scope of the job is not only watchdogging the integrator but also making provisions for important matters such as skills transfer.

Many companies that work with integrators say it's a relationship fraught with danger for the unwary and naive.

"There are many cases where no one in the user organization knows how to use the new systems designed and installed by the systems integrator," Parkinson says. "During the course of the integration project, users have to learn how to take advantage of the new capabilities or decide to outsource. Otherwise, they become hostages of the systems."

Neglecting training and maintenance issues can also produce some major unforeseen costs. Parkinson points to the experience of Schroeders, a London merchant bank that hired a systems integrator to work on a two-year, $12 million contract. The integrator designed a new development environment and database and converted many of the systems to a new operating system, he says, but no provisions were made for maintenance or the training of Schroeders' information systems staff.

As a result, the company had to ask its integration firm to return to conduct training and run maintenance. The integrator worked out a $4 million deal with Schroeders to do on-call maintenance and training for one year.

Parkinson recommends that clients build in critical services when negotiating contracts to avoid staff problems such as low morale, as well as to avoid drawing up costly last-minute contracts. ■

Christopher is a free-lance writer based in Somerville, Mass.

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CITY LIMITS

TO DELIVER TECHNOLOGY, LOCAL GOVERNMENT TECH CHIEFS COMBAT FIEFDOMS, TOUGH REGULATIONS AND EMPTY COFFERS

BY ELLIS BOOKER

Vice President Albert Gore's recent report on streamlining the federal government might well include a page taken from its local offspring. Towns, cities and counties across the U.S. have already come to see information technology as a lever for "reinventing" government, improving its services while eliminating waste and cutting bureaucracy.

Much like their private sector counterparts, information systems departments in municipal government are struggling to downsize and streamline technologies such as client/server computing and administrative arrangements such as data center outsourcing. But in their path are challenges such as fiscal crises, tough procurement regulations and constituents that give more weight to public rather than technical services.

The money shortage affecting IS shops everywhere can also be found hobbling local government IS.

"Funding is a killer," declares Vivienne Dacey, MIS division administrator for the city of Phoenix.

One of Phoenix's top IS projects — a TCP/IP metropolitan-area network that in November will link, initially, 400 of the city's 3,000 departmental PCs on an Ethernet backbone — got through because it was piggybacked on another project: the building of a new city hall.

Others aren't as lucky. "Lots of cities can't afford to get rid of decrepit systems — mostly mainframes — because it would cost too much to build or buy software for whatever new hardware they wanted to bring in," says Kenneth Kraemer, director at the Center for Research on Information Technology and Organizations at the University of California at Irvine. Kraemer recently completed a survey of IS trends in 2,500 cities and counties across the U.S.

Not only are budgets constrained — in Kraemer's sample, 60% of cities expect their IS budget to hold steady in 1994, and 22% expect a decrease — but local government IS is increasingly getting allocated a smaller percent of the total budget than is the case in the private sector. Kraemer's analysis shows that cities spend an average of 4% of their total operating budgets on IS, compared with 8% of total operating budgets spent by private sector service firms.

Beyond funding issues, government IS shops must struggle to reach their goals despite special requirements and pressures encountered only by public agencies.

While private sector companies are often made up of different departments working in harmony, municipal governments are composed of public services and infrastructures, often with conflicting needs. These institutional "fiefdoms" within local governments can make enterprise IS projects a difficult proposition.

For instance, the town of Framingham, Mass., has until recently had a fractured setup, with the IS department under the control of its selectmen — a three-member board. Only those departments under the selectmen had to comply with IS-set directives. A new bylaw, however, enables IS to set directives for all departments.

Bob Wickes Photographer/Jan Nicholas Villa

CITY OF PHOENIX'S VIVIENNE DACEY: "BEING FISCALLY FUNDED CAN BE A DIFFICULTY"

More bureaucratic hurdles

Local governments are also dogged by daunting procurement regulations. Unlike the feds, many city and county governments operate under balanced budget mandates and, therefore, cannot use deficit spending to fund technology initiatives.

"The procurement procedures were implemented in the past 100 years to make sure there are no kickbacks," says Wilpen L. Gorr, professor of public policy and MIS at the Heinz School of Public Policy and Management at Carnegie Mellon University in Pittsburgh. Today, however, "by the time you go through the steps, the technology has changed."

And then there's the transient factor of public employment. Gorr and others note that cities and counties, run by people who must stand for election every few years, tend to be reactive, funding projects that are immediately visible to the voting public, such as extra policemen or firefighters.

"Being fiscally funded can be a difficulty," says Dacey, who adds that she needs to look "way beyond" that horizon to plan IS investments properly. Her IS department's operating budget has see-sawed, moving from $11.4 million for the 1991/1992 fiscal year to $10.9 million last year to $11.5 million this year.

Dacey says the city as a whole is far behind in automation. "We have to find a way to get into the 20th century, let alone the 21st."

Some cities opt to float municipal bonds to pay for long-range capital projects. In 1988, Phoenix created a $22 million municipal fund to pay for projects in five areas: records management; office automation/information sharing; an applications development center; a geographic information system (GIS); and a municipal court management system.

It doesn't help that the success of IS technologies in the private sector have caused the public service expectations of voters to grow. "Citizens are coming to expect 24-hour service and getting their questions answered while they are on the phone," says Tom Fletcher, associate director of the Program on Strategic Computing and Telecommunications in the Public Sector at Harvard University's Kennedy School of Government in Cambridge, Mass.

As a result, a much talked-about goal in government circles at all levels today is the creation of an "accessible, one-stop set of electronic services to take the guesswork out of dealing with government," Fletcher says.

To achieve this feat, three items are dominating the attention of local government IS departments:

- Standardization of hardware and data for use between departments and among levels of local and federal government.

City limits, *page 137*

DEEP COFFERS

Top 10 cities by IS budget (in millions)	Number of government IS employees
Los Angeles	500
San Diego	220
Jacksonville, Fla.	235
Dallas	185
San Francisco	230
Cincinnati	170
Houston	194
Long Beach, Calif.	95
Seattle	100
Detroit	105

Source: *City & State* magazine

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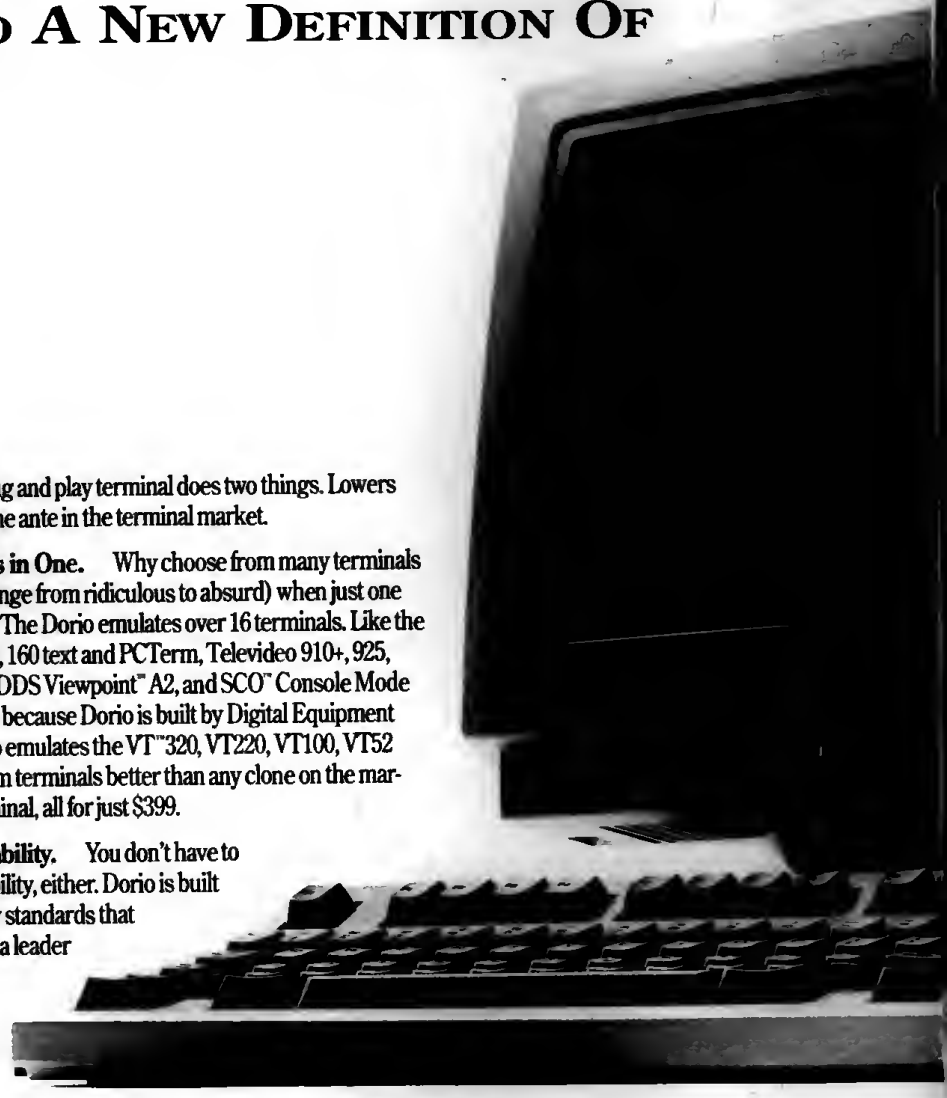

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City limits

CONTINUED FROM PAGE 133

• Information infrastructures, especially related to networks.
• Technical/political issues (information access regulation and privacy).

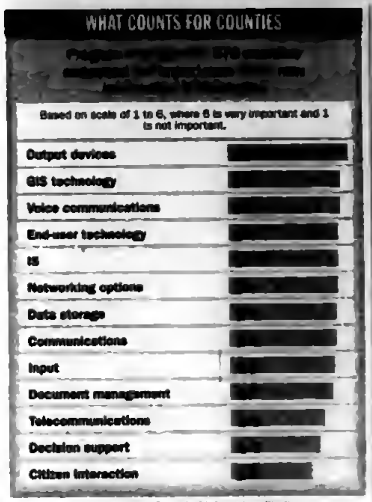
Some local governments are even going beyond merely using technology to providing service and making money. Local governments typically have more latitude in generating revenue from technology than their federal counterparts due to flexible accounting rules.

Fairfax County in Virginia generated roughly $200,000 last year from its on-line database for lawyers and real estate firms. Prince Georges County in Maryland is also generating revenue from an on-line court records system deployed three years ago with Bell Atlantic Corp.

"Local government is taking a dynamic role in managing information and providing needed services to the private sector, which is a twist," says Costas Toregus, president of Public Technology, Inc., a Washington, D.C.-based nonprofit research company for cities and counties.

Fletcher summed up the pressure on local government IS: "To say that city hall is open 9 to 5, Monday through Friday, is becoming less and less satisfactory to citizens." ■

Kim S. Nash, Thomas Hoffman and Stephen P. Klett Jr. contributed to this report.



Source: Syracuse University, School of Information Studies

Private sector 'graduates'

As government IS plays catch-up with the commercial sector, it is increasingly tapping from that well of know-how, expertise and can-do attitude found in the private sector.

For instance, the Top 2 IS officers for the city of Phoenix came from large nongovernmental companies. Vivienne Dacey, MIS division administrator, and IS director Laraine Rodgers both came to Phoenix from AT&T.

Dacey, who has an IS budget of approximately $11 million this year, says that in her own IS hiring she looks for wide, private sector experience. Private sector employees, she says, are more goal-oriented and not as mired in bureaucratic thinking.

However, not everyone agrees that staffing government IS shops with employees weaned in business is a great idea.

"[These employees] have to have some appreciation for the legitimate political restraints," such as privacy issues and accountability to constituents, says Tom Fletcher at Harvard's Kennedy School of Government.

Still, the problem of IS staffing in local government is pandemic. In general, government is a revolving door for technical people, according to Professor Wilpen L. Gorr at Carnegie Mellon University.

"A lot of people who want to get technical training will start with a government agency and then move on to a private firm where the pay is better," Gorr says.

Facing this reality, some IS executives in local government are hiring the only employees they can afford. Most of the 81 employees at Fairfax County's Cooperative Computer Center in Virginia, for instance, were hired right out of high school and trained in-house.

—Ellis Booker

HEALTHY: DADE COUNTY

Invigorated by GIS, fiber-optic projects

Don't expect to find miles of red tape strangling Dade County, Fla., or its IS operations. Once Joacquin Avino became the Dade County manager in June 1988, he encouraged the municipality's supporting agencies to run their groups like private businesses.

Since then, Dade County's IS division has entered into a handful of cooperative alliances with private sector firms, including a shared GIS project with Florida Power & Light Co. and a fiber-optic highway barter agreement with intermedia Communications of Florida, Inc.

In 1987, Dade County laid 20 miles of fiber-optic wire to connect its primary data center with the downtown government center and the justice center. Then, in 1990, Intermedia approached Dade County about obtaining a right of way to lay its fiber-optic lines through county conduits.

Manuel Garcia

Realizing that a barter agreement would benefit both, the two groups later that year signed a contract that netted Dade County $200,000 a year in revenue and 25 free miles of fiber-optic connections, says Manuel Garcia, director of Dade County's information technology department.

The deal saved Dade County $1.5 million because Intermedia laid down the additional fiber.

Using the fiber-optic backbone, Dade County expects to connect 20,000 of its switches and computer terminals by the end of 1997, Garcia says. At present, the county has linked 4,000 terminals and PCs through the initial fiber project, which has saved the municipality an extra $300,000 annually in data circuit costs once paid to the phone company.

Dade County has also profited from a GIS development contract it entered into with Florida Power in May 1992.

A few years earlier, Dade County had developed a network-based street GIS used by the police and other departments. However, Garcia says, the GIS wasn't accurate enough.

Enter Florida Power, which had been running its own pilot GIS to route its service technicians. By sharing costs to create the GIS files with Florida Power, the county saved $1.5 million in development and expects to save $120,000 annually in maintenance. The files are expected to be developed by year's end.

—Thomas Hoffman

AILING: CITY OF ANAHEIM

Squeezing life out of wheezing systems

City of Anaheim's Dan Amyx: 'We just don't have the cash to play with'

Bruised by economic recession, information systems at the city of Anaheim, Calif., have come to a standstill.

It all comes down to money.

More than 16% — or $1 million — has been carved out of Anaheim's original $6 million IS budget for fiscal 1993. The city's IS staff of 36 is about half the 70-odd data processing personnel that worked for the city two years ago.

"Until a few years ago, we always planned long-term projects. Now our biggest new project is surviving," says Dan Amyx, manager of data processing. Anaheim can't afford new technologies, even if it would save money in the long run.

"We just don't have the cash to play with," he says.

Like most local governments, Anaheim's IS group charges back to user departments based on processor use, space and equipment maintenance levels. Right now, only one user — the public utilities group — is embarking on new projects and accounts for more than half of the IS department's business. The group plans to install an IBM AS/400 for customer billing.

"That'll be a 12- to 18-month project," Amyx says, "if the city council approves it."

Anaheim's budget depends on tax dollars brought in by well-attended attractions such as Disneyland and the California Angels' Anaheim Stadium. "When people aren't coming to conventions or taking in ballgames, that's a drop in dollars for us," he explains.

The city has thus far kept IS in-house, refusing to go the outsourcing route that Orange County (where Anaheim is located) chose 15 years ago. It fears losing control and ultimately paying more for external services than it would cost to keep IS internal.

Anaheim is, however, considering farming out specific tasks. One target is its 15-year-old billing system, which can't accommodate the U.S. Post Office's Zip+4 system. A request for the proposal is slated to go out this month.

"We hate to give up control, but there are some things other people can do more cheaply than we can," Amyx acknowledges.

—Kim S. Nash

it's all time high, wiping out more th... billion to shareholder value.

'Steep Learning Curve'

These pressures leave little time for a new boss to master IBM's business. Fully 51% of IBM customers surveyed by Computerworld magazine say IBM needs to hire a CEO with a technology background. With Mr. Gerstner lacking such a pedigree, "he's going to be on a very, very steep learning curve," says David Hanna, a former IBM executive who is now president of Hanna Group, a computer-consulting

THE WALL STREET JOURNAL
March 25th, 1993

Computers & Automation

"Information systems managers are grasping onto this as a Holy Grail," said Paul Gillin, executive editor of Computerworld, which is just one of many industry trade publications that spotlight reengineering on a regular basis. "It is an important leap for corporations."

The hype should reach crescendo in May, when a new book by management consultants Michael Hammer and James Champy will be ... "Reengineering the Corporation."

Investor's Business Daily
March 25th, 1993

Their question: Where are the productivity savings?

The New York Times
April 25th, 1993

CORPORATE executives appear to be more knowledgeable about computer technolgy than ever before, but they have also become more demanding and less orgiving, a new survey has found. While they believe information technologies are the key to competitive advantage, they also say that they have not been getting their money's worth.

The survey, conducted by the computer industry newspaper, Computerworld and Andersen Consulting, also found that 81 percent of top executives are personally using computers in their daily jobs, nearly double the percentage reported when the survey was first taken four years ago.

More than 200 chief executives, chief operating officers, and chief financial officers, representing a broad range of businesses, participated in the study, the results of which were published in Computerworld last week. Annual company sales ranged from $250 million to $20 billion.

CUSTOMERS HAVE THEIR SAY TOO

■ IBM directors should forget about hiring another salesguy to replace John Akers as CEO. And whoever he is, Akers's successor should fire a whole lot more people. So says a *Computerworld* survey of executives at 100 companies that spend at least half their computer budgets on IBM products. The participants, who work at the likes of Kmart and Parker Hannifin, a maker of pneumatic and hydraulic components, also said IBM's reorganization into smaller business units should go further.

Computerworld, in addition, interviewed various computer industry luminaries, including Steve Jobs. The Next CEO marveled that none of IBM's machines from mainframes to PC's uses the same software. Says Jobs: "IBM's troubles stem from the fact that they approach everything from a hardware strategy, and the Nineties is a software decade."

Not everybody agreed that breaking up is the way for IBM to go. Said Larry Ellison, CEO and co-founder of Oracle, a software company: "This is the

... Richard is a retired I.B.M. vice president.

A survey of some 100 of I.B.M.'s largest customers by Computerworld magazine found that 51 percent preferred someone with a technical background to be the computer giant's new chief executive, while 36 percent said technical expertise was not essential and 13 percent had no opinion.

But some industry experts say technology know-how ...

93 FORTUNE 11

FORTUNE
April 5th, 1993

SEE, THERE'S A MOUSE in the corner office. The percentage of executives who regularly use computers nearly doubled in four years, to 81% from 42% in 1989, says a study by Computerworld magazine and Andersen Consulting. Fewer than half think they are getting their money's worth from corporate computer systems.

THE WALL STREET JOURNAL
April 20th, 1993

The New York Times
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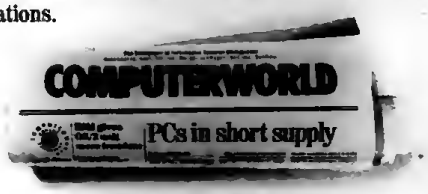

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UNIX VARIANTS
How different are they?

By Joe Panepinto

IN THE 1970s AND 1980s, the proliferation of Unix flavors led to innovation. In the 1990s, the resulting Unix smorgasbord can lead to indigestion.

At last count, more than 40 Unix variants were commercially available. A debate about which Unix is best could rapidly escalate into a technical feature-by-feature snooze-fest at best, a grand-scale holy war at worst.

For those seeking an information systems career in Unix systems administration, programming or development, there are a few overriding concerns — among them, how steep is the learning curve from one Unix variant to another and what are some of the differences between variants.

The learning curve

From a careers and skills perspective, the basic differences among the Unix variants emanate from differences in the operating system kernels on which they are based: Berkeley Software Distribution (BSD) or Unix System V from Unix System Laboratories, Inc. In addition, there are hybrid Unix variants that stray far from either BSD or System V such as IBM's AIX, the Open Software Foundation's OSF/1, Apple Computer, Inc.'s A/UX and Next, Inc.'s NextStep. Those versions of Unix incorporate some elements of object-oriented technology and have steeper learning curves, especially for systems administration.

In general, however, skills in Unix are easily transferable and are becoming even more so. In addition, many of the best features of BSD and Unix System V have been brought together in Unix System V Release 4.

"Learning one Unix variant means you're 90% or 80% of the way to learning any of the others," says Nortoo Greenfield, director of Unix systems at Computer Intelligence/InfoCorp in Santa Clara, Calif. Bill Reiken, principal consultant at .SH Consulting in Santa Clara, Calif., says he sees the differences among Unix variants as interpretations of a single language and not as wholly different languages.

"A knowledgeable person could speak in New England or Texas and still be understood, though there could be some very frustrating differences in the accents," Reiken says.

For Unix programmers and developers, the development language is always the same: ANSI C; the standard application programming interfaces are the same: Posix, X Portability Guide, System V Interface Definition; and the shell languages are the same: sh, csh, ksh. Even so, programming differences do exist.

For example, if a programmer wishes to zero out a block of storage in System V Release 4, the command is memset; BSD systems use the command bzero.

"If people want to make sure their knowledge doesn't become obsolete, they should train on [System V Release 4] because it is where there has been a large effort to bring all this stuff together," says Ray Swartz, president of Berkeley Decision Systems, makers of Training on Video products for learning Unix.

Even for those who have been weaned on BSD Unix, the transition is not difficult. In the example above, the programmer does not need to memorize the BSD equivalents of System V Release 4 commands because System V Release 4 provides a ucblib directory that contains an archive library with equivalent BSD commands. The programmer only needs to name the library on the compile line, and all the recognized BSD commands will be converted to System V Release 4.

Unix systems administrators face similar niggling differences. For example, the control files are different. In BSD, the .rc (run command) shell script is a single ASCII file that calls to other files for start-up and customization (for example, TCP/IP); in SVR4 there are different .rc directories at each run level.

"The differences are there, but an experienced Unix system administrator would be able to navigate either system with the basic Unix knowledge that .rc stands for run command," Reiken says. To find all control files, a system administrator on either BSD or System V Release 4 Unix could use the command ls\etc*rc*.

"Everyone who doesn't like Unix makes a big deal about the differences," says Paul Cubbage, principal analyst of software tools at Dataquest, Inc. "But once you learn Unix, dealing with the variants is not a big deal."

Panepinto is a free-lance writer in Amherst, Mass.

Analysts agree that market consideration is based almost entirely on marketing decisions and not on technical differences among the Unix variants

The Top 5 variants in the worldwide commercial Unix application market	The Top 5 variants in the worldwide technical Unix application market
1. IBM's AIX	1. Sun's Solaris 1.0
2. Hewlett-Packard's HP/UX	2. HP's HP/UX
3. NCR/AT&T's System V Release 4	3. IBM's AIX
4. Sun's Solaris 1.0	4. Silicon Graphics' Irix
5. Siemens/Nixdorf Information Systems' Sinix	5. Integraph's Clix

Source: International Data Corp., Framingham, Mass.

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RANDOM NOTES

LAN training

IN 1992, the average price for either operational or administrative training for LANs was $750 per day for an average of four days, or $3,000 per LAN. By 1995, this is expected to drop only $100, to $2,900 per LAN. Training time is expected to remain constant.

Source: Market Intelligence Research Corp., Mountain View, Calif

HELP DESK

AVERAGE ANNUAL SALARIES

BASE: 1,694 RESPONDENTS

Call screening and dispatch: Takes calls and routes to the correct support area.	
First level support: Answers phones and solves 50% or more of the problems handled.	$28,287
Second level support: Can solve the majority of problems. Some phone duty.	
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Manager: Responsible for the entire help desk function.	

SALARY BOOSTERS

- Help desk experience
- LAN support experience
- Continued education
- PC support skills
- Data processing experience

BASE: 1,792 RESPONDENTS

Source: Help Desk Institute, Colorado Springs

[redacted]

LIGHTS, CAMERA, ACTION!

Hewlett-Packard Co. in Cupertino, Calif., and Littleton, Colo.-based Virginia A. Ostendorf, Inc. are presenting a satellite-delivered workshop called "Training by Live Television."

The program was designed for trainers and managers who wish to learn more about teaching remote learners via live television. It will air Oct. 5 at 12:30 p.m. Eastern time and will be broadcast to both HP sites and others licensed to host the event. For more information, contact Virginia A. Ostendorf, Inc. at (303) 797-3524.

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STORAGE MGMT. SYS PROG $90K Must have SMS HSM DASD CICS
OOP/OOS/OOA, C++, SMALLTALK DSGN/CODE Business Apps $60K
IDMS DBA Solid Colorado employer $60K
INFORMIX DBA ONLINE ENGINE ESQLC TO $60K
CICS/DB2 PROG./ANALYSTS $55K 2+ yrs w/degree (tracking) 3+
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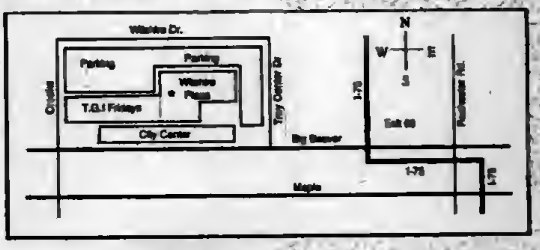

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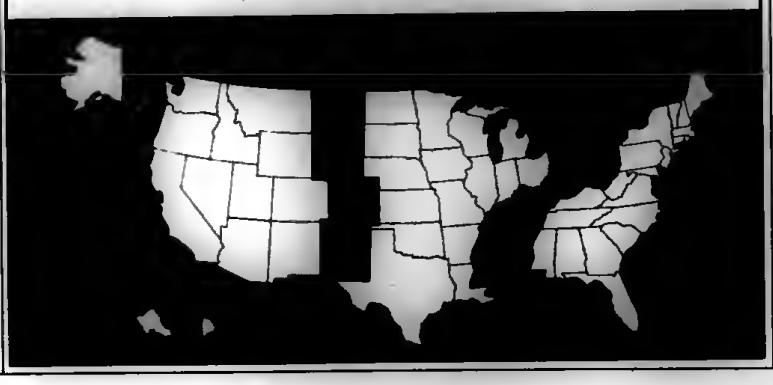

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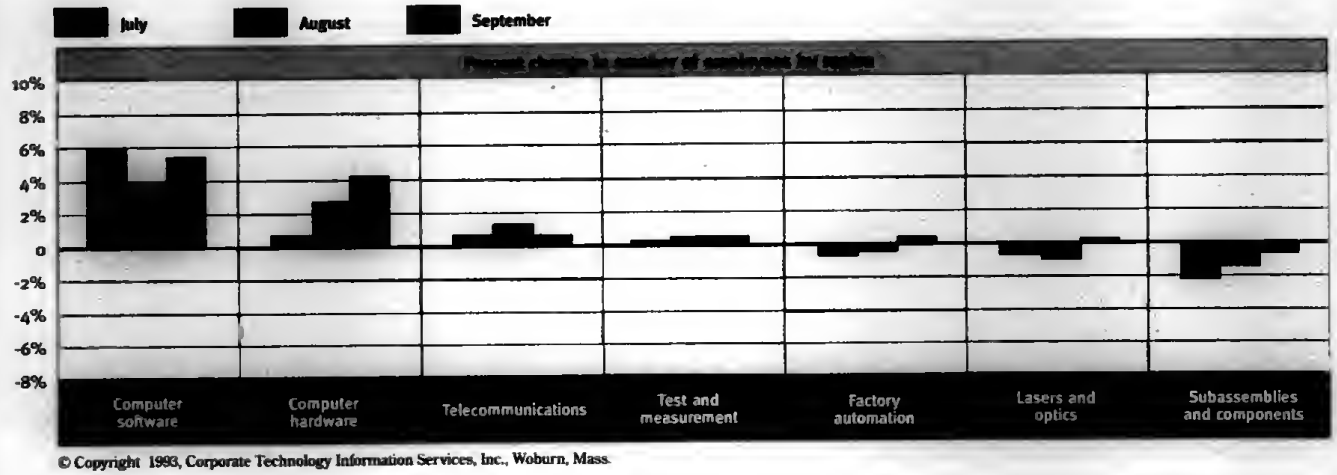
The month of September produced a hiring surge in many technology industries



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BEST READ

the PRICE for ADVICE

Even though they're in the minority, some consultants don't have your best interests at heart

By Dan Allen

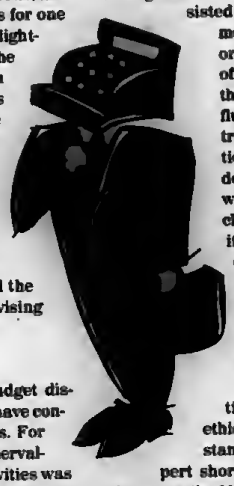
As a rule, information systems management consultants display the highest integrity. They work hard, bill their time accordingly and are generally ou the up and np.

On occasion, however, a few stray from these good intentions. They overstate their abilities, hide unflattering truths and allow their clients to act as the check and balance on their activities. Luckily, those consultants are few and far between.

To guard against qnestionable practices, it's important to understand how consultants bill their time. Each day, they must charge eight hours to one or more project codes. The goal is to charge as much as possible to paying client codes and avoid charging to nonclient codes such as training and proposal development or to codes with no budget.

Because the number of billable hours is used as the basis for promotions and firings, some consultants pad their figures. Asking for detailed time accounting reports may help, but consultants know how to play the game.

I was ouce ou a 30-member consulting team conducting 10 simultaneous, independently contracted projects for one client. The combined fee ran slightly more than $t million, and the client insisted that the team track its time. Some projects ran wildly over budget, while some ran significantly under. We itemized the bill by project, bnt it didn't accurately reflect our time, so we adjusted it. It also didn't hint that 15% of the fee funded the time it took to fabricate the bill. Essentially, we billed the client about $150,000 for devising the elaborate scam.



Start-up budgets

If we had mentioned the budget discrepancies, the client might have considered some items frivolous. For instance, one of the most undervalued and underbudgeted activities was the time required to get a project off the ground. Consultants usually include a few days as a token start-up budget for a three-month engagement, but preparation can take more like a month. Start-up time includes courtesy calls to client personnel and studying information to understand the project's goal. In this case, if the client had known we spent a month getting started, we might have looked incompetent.

In the above example, the client was satisfied with the results, but none of the day-to-day team members had significant experience in the client's industry or generic issues. Our expertise consisted of brokering agreements among the various organizational groups, often rubber-stamping the views of the most influential. It was our contribution to the reputation consultants have for doing little more than writing down what the client says and parroting it back. While parroting, or more politely, reflecting, is legitimate and potentially valuable, the service requested was significantly more sophisticated.

At times, certain practices almost cross clear ethical boundaries. For instance, we brought in an expert shortly before the end of a three-month, $100,000 project. The expert found the draft project recommendations so out of date that he recommended starting over. Instead of telling the client and risking our credibility, we went forward with an amateurish report and the expert, who was also a partner at our firm, backed us up.

Proceed with caution

Of course, none of this should dissuade you from using consultants. Currently, I'm working with four different consultancies, and I can't imagine the project succeeding without them.

You must understand that they are buman; deal with them in an open and candid way, and avoid putting them in a position where your interests conflict. If the client with the t0 subprojects had realized how difficult it is to track 30 people's time across 10 projects, he wouldn't have asked for such a detailed report or at least would have been directly involved to ensure its integrity.

You must also be willing to work openly to adjust budgets as variances are identified. In our case, there should have been no embarrassment. The client would have probably understood that project estimates are rarely accurate and would not have pressured us to keep to an unrealistic budget.

Finally, there are two primary defenses to protect against phony expertise. First, establish long-term relationships with consultants so you can come to understand their strengths and weaknesses. Second, become enough of an expert yourself to recognize a con when you see one.

Allen is a former management consultant.

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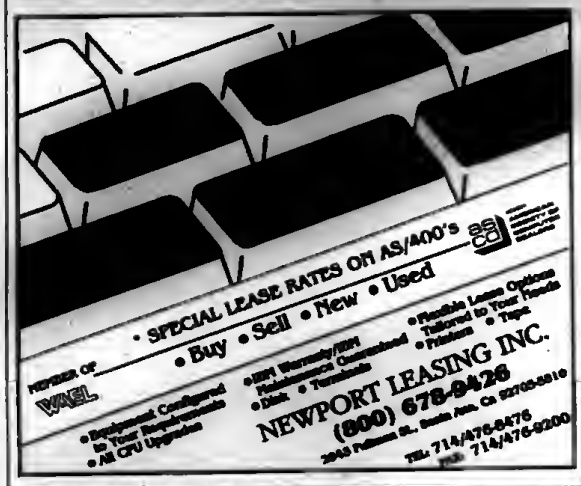

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	Closing Prices BoCoEx	Closing Prices AmCoEx
IBM PS1 386SX/25	$850	$700
PS/2 Model 70-A21	$750	$775
PS/2 Model 55SX	$650	$700
ThinkPad 700C	$3,800	$3,400
PS/2 Model 90-OH9	$1,700	$1,525
PS/2 Model 95-OJF	$3,000	$2,650
Compaq Prolinea 4/66	$2,000	$2,100
Prolinea 486/50	$1,450	$1,575
Portable 386	$650	$650
SLT-386	$925	$850
LTE-386	$575	$600
Presignia 486/66	$6,000	$3,650
Apple Macintosh SE	$550	$500
IICX	$1,300	$1,000
IICI	$1,950	$1,475
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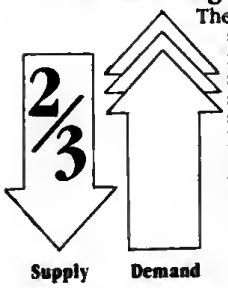
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

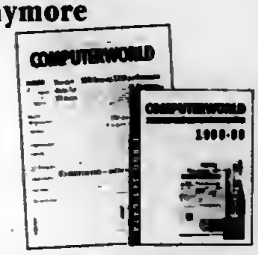
What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore



That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

For every 10 of today's computer job seekers . . .
2 are Active ☐ ☐
7 are Passive ☐ ☐ ☐ ☐ ☐ ☐ ☐
1 is a Non-mover ☐

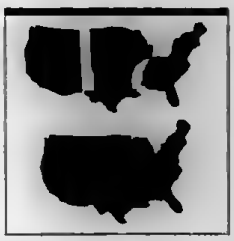
In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

More job seekers see your ad in Computerworld than in any other newspaper — Sunday, daily, or trade

That's because *Computerworld* reaches over 629,000 qualified computer professionals every week — the largest audience of its kind, and one that's rich with passive and active job seekers.

That's why more companies advertise more jobs in *Computerworld* than in any other professional newspaper. And why *Computerworld* is the *single place* where America's computer professionals *expect* to see the most jobs every week.

Computerworld gives you regional editions



A key option when you need a regional candidate and want to avoid national response and relocation. Yet if your search is national in scope, *Computerworld* can also give you more widespread national exposure than any other source.

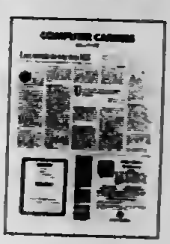
Computerworld needs just 2 working days for your ad to appear

That's comparable to most local newspapers. And why your ad can quickly appear in the next issue to start generating quality response.

Computerworld costs no more than local papers

And with a regional rate of just $199.42 per inch, your cost-per qualified candidate reached is better than any newspaper. Sunday, daily or trade. Or just about any other source, for that matter.

Computerworld leads candidates to your ad



Just look at this week's Computer Careers section. You'll find a career editorial topic that will stir the interest of virtually any computer job seeker — passive *or* active. It's just one of countless reasons *Computerworld* is America's newspaper of choice on computing. No matter how much the times change.

And while times may change, some things won't. Whether you *use* computers, *make* computers, or sell products and services *for* computers, *Computerworld* is still your major source of news today. And your major source of computer professionals tomorrow.

For more recruiting tips, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

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Digital Comm. Assoc.	37.6	Microcom Inc.	-16.7
Cirrus Logic	25.8	Platinum Technology (L)	-14.6
Telebit Corp.	24.4	Data Race Inc. (L)	-13.7
Ultimate Corp.	22.7	Iomega Corp (L)	-12.5
CE Software	21.2	Netrix Corp.	-10.5
Sybase Inc.	19.8	Data Switch Corp.	-10.0
Tandem Computers Inc.	19.2	Fibronics Int'l Inc.	-9.6
Convex Computer	18.9	ChipSoft	-8.3

Dollar

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Sybase Inc.	11.00	3M Corp	-4.00
BMC Software Inc.	7.00	American Info Techs Corp.	-2.25
Cirrus Logic	7.00	Bell Atlantic Corp.	-1.75
Oracle Corp.	6.63	Data Race Inc. (L)	-1.75
Cabletron Systems	6.13	BGS Systems Inc. (L)	-1.75
Motorola Inc.	6.13	Platinum Technology (L)	-1.63
Lotus Development	5.50	Storage Technology	-1.63
Digital Comm. Assoc.	5.11	Novell Inc.	-1.38

[redacted]

Some IPOs sink after soaring

NetManage, Inc. (NETM) showed last week that the initial public offering (IPO) craze is not over for technology companies. But the splashiest IPOs in the past year have not provided the best long-term returns.

NetManage, a Cupertino, Calif.-based maker of network applications and development software, zoomed up 52% to close at 24¼ on its first day of trading. Several other high-tech IPOs this year, including **Powersoft Corp.** (PWRS), **Gupta Corp.** (GPTA) and **MathSoft, Inc.** (MATH), have come close to doubling their share price on first-day enthusiasm.

However, at Tuesday's close, Powersoft ranked as only the 20th best gainer (up 37%) among computer stocks that hit the market in the last year, starting July 1992. Meanwhile, after less spectacular starts, superserver vendors **Parallan Computer, Inc.** and **Tricord Systems, Inc.** have both outperformed Powersoft. Each is up roughly 75%. **Banyan Systems, Inc.** (BNYN) is up 82% since its IPO, and **PeopleSoft, Inc.** has gained 78%. (See chart for the top gainers.)

The one-year period saw 51 computer-related IPOs that were worth $10 million or more; on Tuesday, 27 of them stood above their IPO price. Seven more were roughly even with their initial pricing, while 17 issues had lost ground.

Gupta and MathSoft numbered among the losers. Gupta finished Tuesday at about 20% below its February IPO price of 18, while MathSoft was down 56% from its IPO price. Joining MathSoft at the bottom of the list were **Computervision Corp.** (CVN) at 75% off its initial price, **Netrix Corp.** (NTRX), down 64%, and **Electronic Retailing Systems, Inc.** (ERSI), down 48%. —*Derek Slater*

Best buys

Top performing stocks that went public in the four quarters starting July 1992

Company	IPO date	IPO price	Recent price	Change
[illegible]	4/8/93	5	12⅜	148%
[illegible]	4/7/93	14	33½	139%
[illegible]	10/22/92	14	29	107%
[illegible]	10/20/92	14¾	30⅜	106%
[illegible]	7/1/92	7	13½	93%
[illegible]	5/3/93	15	28¾	92%

Exch	52-Week Range High	52-Week Range Low	Company	Sept. 24 3pm	Wk Net Change	Wk Pct Change
[illegible]						
OTC	40.00	15.43	3 COM Corp	30.58	3.13	11.5
NYS	91.12	63.38	American Info Techs Corp.	87.38	-2.25	-2.5
NYS	65.00	40.61	AT&T	59.50	0.13	0.2
OTC	4.06	0.75	Artel Communication Corp	3.06	-0.25	-7.5
OTC	24.50	12.50	Banyan Systems Inc	18.88	0.58	2.0
NYS	64.88	44.50	Bell Atlantic Corp	62.63	-1.75	-2.7
NYS	62.88	46.75	BellSouth Corp (H)	61.13	-0.50	-0.8
NYS	14.75	3.61	Bolt, Beranek & Newman	10.75	0.25	2.4
OTC	18.50	9.50	Brooktrout Technology	12.50	0.50	4.2
NYS	119.00	54.41	Cabletron Systems	109.00	6.13	6.0
OTC	35.00	4.63	Centigram Communications	31.88	1.13	3.2
OTC	55.50	20.25	Chipcom Corp	54.75	4.75	9.5
OTC	59.25	24.00	Cisco Systems Inc	47.25	1.00	2.2
OTC	16.38	5.50	Compression Labs Inc	14.25	0.50	3.6
OTC	36.00	17.00	CrossComm	28.00	0.50	1.8
OTC	4.63	1.63	Data Switch Corp	2.25	-0.25	-10.0
NYS	19.88	12.58	Digital Comm. Assoc.	18.75	5.11	37.6
OTC	12.75	3.75	Digital Systems Int'l Inc.	4.50	0.50	12.5
OTC	67.88	10.75	OSC Communications	61.75	1.75	2.9
OTC	9.50	4.75	Fibronics Int'l Inc.	5.88	-0.63	-9.6
OTC	24.00	8.75	FileNet Corp	15.00	2.00	15.4
OTC	4.58	1.50	Gandalf Technologies Inc.	2.13	-0.19	-8.1
OTC	2.06	0.75	Gateway Communications	0.88	0.00	0.0
NYS	15.75	3.25	General DataComm Inds.	11.75	-0.58	3.1
ASE	3.75	2.00	Go Video	2.61	0.19	7.7
NYS	39.00	22.58	GTE Corp (H)	38.38	0.38	1.0
NYS	94.75	63.25	ITT Corp	92.25	0.58	-0.4
OTC	29.88	16.81	MCI Communications Corp	27.50	0.88	-3.1
OTC	6.50	1.50	Microcom Inc.	2.50	-0.50	-16.7
OTC	24.25	3.50	Netrix Corp	4.25	-0.50	-10.5
OTC	19.00	8.50	Network Computing Devices (L)	7.25	0.25	3.6
NYS	15.00	5.58	Network Equipment Tech	8.50	0.50	6.3
OTC	20.12	8.00	Network General	12.88	0.62	5.1
OTC	15.75	6.88	Network Systems Corp	7.75	0.00	0.0
OTC	23.88	8.94	Newbridge Networks Corp	68.75	4.75	2.4
NYS	46.00	21.38	Northern Telecom Ltd	24.88	-0.63	-2.5
OTC	35.25	17.63	Novell Inc.	17.75	-1.38	-7.2
NYS	68.88	39.50	Nynex Corp. (H)	47.75	-1.00	-2.1
OTC	30.00	14.50	Octel Communications Corp.	22.50	1.50	7.1
OTC	6.12	3.58	Penril DataComm Networks	4.13	-0.25	-5.7
OTC	30.50	12.50	PictureTel Corp	18.75	1.25	7.1
OTC	11.50	3.63	Proteon Inc.	4.88	-0.13	-2.5
NYS	27.88	17.50	Scientific Atlanta Inc.	37.61	2.00	5.6
NYS	47.00	31.75	Southwestern Bell Corp	43.25	-0.75	-1.2
NYS	37.58	22.25	Sprint Corp	36.58	0.82	1.7
OTC	27.00	12.50	Standard Microsystems Corp.	23.75	2.25	10.5
OTC	18.50	9.25	StrataCom Inc	12.50	-0.50	-3.8
OTC	42.75	12.84	SynOptics Communications	27.75	2.25	8.8
OTC	6.63	2.88	Telebit Corp	6.58	1.25	24.4
OTC	16.00	2.62	Telematics Int'l Inc (H)	16.00	1.00	6.7
OTC	22.75	15.25	US Robotics	32.25	2.50	12.2
NYS	48.75	35.25	US West Inc. (H)	47.88	-0.25	-0.5
OTC	56.00	19.50	Wellfleet Communications	50.38	4.38	9.5
OTC	19.50	7.25	Xircom	17.00	0.00	0.0
[illegible]						
OTC	5.56	2.50	Advanced Logic Research	2.75	-0.13	4.1
OTC	65.25	23.50	Apple Computer Inc. (L)	24.75	-0.75	-2.9
OTC	24.25	12.75	AST Research Inc.	18.13	2.63	16.9
NYS	9.25	2.50	Commodore Int'l	3.25	0.00	0.0
NYS	61.75	31.00	Compaq Computer Corp.	50.75	1.25	2.2
OTC	49.88	11.50	Dell Computer Corp	17.58	0.13	0.7
NYS	89.25	50.25	Hewlett Packard Co.	88.88	1.00	1.5
NYS	41.25	17.43	Silicon Graphics	41.25	2.63	6.8
OTC	41.00	24.00	Sun Microsystems Inc.	26.88	1.25	4.9
NYS	36.88	24.63	Tandy Corp. (H)	35.88	0.00	0.0
OTC	7.00	2.88	Zeos International Ltd.	3.00	-0.19	-5.9
[illegible]						
ASE	9.58	4.50	Amdahl Corp.	5.88	0.58	4.8
NYS	8.75	3.63	Convex Computer	5.50	0.88	18.9
OTC	6.13	2.25	Cray Computer	4.50	0.25	5.9
NYS	30.88	19.00	Cray Research Inc	23.75	0.58	1.6
NYS	13.88	7.75	Data General Corp	8.63	0.00	0.0
NYS	49.25	30.58	Digital Equipment Corp	38.25	-0.25	-0.6
NYS	44.00	78.75	Harris Corp	42.38	1.75	4.3
NYS	82.88	40.63	IBM	41.88	-1.13	-2.6
OTC	25.75	5.50	Kendall Square Research	22.50	1.75	8.6
NYS	141.50	83.00	Matsushita Electronics	134.75	-1.25	-0.9
OTC	23.75	8.25	NetFrame	15.75	-0.75	-4.5
OTC	23.50	9.25	Parallan Computer	21.50	2.00	10.3
OTC	23.25	6.00	Pyramid Technology	20.63	-0.25	-1.2
OTC	24.00	11.25	Sequent Computer Sys.	15.50	0.50	3.3
OTC	7.13	1.38	Sequoia Systems Inc	2.25	-0.13	-5.3
NYS	44.50	20.25	Stratus Computer Inc	24.75	0.75	3.1
NYS	16.88	8.50	Tandem Computers Inc	11.63	1.88	19.2
OTC	21.50	10.63	TriCord Systems	20.25	1.00	5.2
NYS	13.88	2.75	Unisys Corp.	21.25	0.25	2.2
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OTC	37.00	12.63	Adobe Systems Inc	18.00	1.25	7.5
OTC	20.75	10.25	Aldus Corp	20.50	1.75	9.3
OTC	11.75	5.50	American Software Inc	6.88	-0.50	-6.8
OTC	28.12	9.50	Ask Computer Systems	11.13	0.13	1.1
OTC	56.75	58.75	Autodesk Inc.	48.50	0.25	0.5
OTC	8.50	2.50	Bachman Info. Systems	3.50	0.13	3.7
OTC	43.00	26.75	BGS Systems Inc. (L)	24.75	-1.75	-6.6
OTC	84.12	58.75	BMC Software Inc.	61.75	7.00	12.8
OTC	28.25	18.00	Boole & Babbage	24.88	0.88	3.6
OTC	62.00	12.75	Borland Int'l Inc. (L)	15.00	1.12	8.1
OTC	5.00	2.75	CE Software	3.50	0.63	21.2
ASE	40.25	11.16	Cheyenne Software Inc	31.62	0.58	1.2
OTC	19.50	8.25	ChipSoft	13.75	-1.25	-8.1
OTC	8.88	5.63	Cognos Inc	7.38	-0.25	-3.3
NYS	32.75	14.50	Computer Associates	32.75	2.63	8.7
NYS	9.63	2.75	Computervision Corp	3.13	0.00	0.0
OTC	14.25	19.25	Compuware Corp.	23.13	-1.13	-4.6
OTC	14.75	5.75	Comshare Inc.	9.25	0.13	1.4
OTC	31.50	10.75	Corel Corp. (H)	30.88	0.50	1.6
OTC	15.25	5.00	Easel Corp	6.25	-0.25	-3.8
OTC	25.25	12.00	4th Dimension	21.25	0.50	-2.2
OTC	19.25	5.25	Frame Technology	7.88	0.25	3.3
OTC	17.50	8.00	Group 1 Software (L)	9.50	1.50	18.8
OTC	35.25	10.00	Gupta (L)	14.88	-0.58	-2.5
OTC	11.00	4.50	Hogan Systems Inc. (H)	10.75	0.50	4.9
OTC	25.75	11.25	IMRS	17.00	-1.00	-5.6
OTC	44.75	24.25	Information Resources	41.25	-0.25	-0.6
OTC	27.25	10.13	Informix Corp.	21.75	3.00	16.0
OTC	14.50	8.50	Intergraph Corp	10.00	-0.61	-5.9
OTC	13.63	5.88	Interleaf Inc. (L)	6.50	0.00	0.0
OTC	16.50	4.75	Intersolv Inc.	8.25	0.12	1.5
OTC	16.00	7.75	KnowledgeWare Inc.	10.50	0.38	3.7
OTC	54.75	15.50	Legent Corp	21.13	2.00	10.5
OTC	43.75	14.75	Lotus Development	43.75	5.50	14.4
OTC	23.00	4.25	MathSoft	6.00	0.75	14.3
OTC	23.25	4.50	McAfee Associates	8.50	0.25	3.0
OTC	11.63	2.50	Mega Software	4.81	-0.06	-1.3
OTC	12.00	5.25	Mentor Graphics	10.00	0.38	3.9
OTC	46.00	26.25	Micro Focus	27.75	0.75	2.8
OTC	13.25	4.38	Micrografx Inc.	2.75	1.00	14.8
OTC	98.00	70.38	Microsoft Corp.	78.75	2.25	2.9
OTC	59.25	18.63	Oracle Corp	59.25	6.63	12.6
OTC	80.00	21.50	Parametric Technology	38.25	1.50	4.1
OTC	40.50	22.50	PeopleSoft	33.25	1.00	3.1
OTC	7.11	3.75	Phoenix Technologies	4.19	0.00	0.0
OTC	40.00	22.00	Powersoft	28.75	1.00	3.6
OTC	30.25	11.34	Platinum Software	29.88	-0.12	-0.4
OTC	25.00	9.50	Platinum Technology (L)	9.50	-1.63	14.6
OTC	61.50	37.25	Progress Software Corp.	50.00	3.38	7.2
OTC	7.38	2.56	Quarterdeck Office Sys.	2.75	-0.06	-2.2
OTC	32.00	15.75	Rainbow Technologies Inc	25.13	-1.00	-3.8
OTC	11.38	4.00	Rasterops	9.50	-0.75	-7.3
OTC	15.25	3.62	Ross Systems	12.88	1.88	12.0
OTC	28.75	9.63	Sapiens Intl. Corp. N.V.	26.50	-1.11	-4.1
OTC	14.50	5.50	Software Publishing Corp	6.50	0.00	0.0
OTC	14.25	2.63	Software Toolworks Inc	12.38	0.88	-0.8
OTC	2.75	0.75	Spinnaker Software	1.50	0.03	2.0
OTC	13.25	3.38	State of the Art	11.00	0.50	4.8
NYS	24.63	15.00	Sterling Software Inc.	22.25	0.25	1.1
OTC	21.63	8.00	Struct. Dynamics Research	15.38	0.50	3.4
OTC	77.50	32.75	Sybase Inc.	66.50	11.00	19.8
OTC	19.50	5.88	Symantec Corp.	19.50	1.38	7.6
OTC	25.50	10.00	System Software Assoc.	16.88	2.25	15.4
OTC	6.38	2.75	Timmic Corp	4.38	0.38	0.6
OTC	24.25	11.25	ViewLogic Systems	23.25	2.13	10.1
OTC	23.50	5.50	Walker Interactive Systems	6.75	0.00	0.0
OTC	3.19	1.00	WordStar	1.19	0.00	0.0
[illegible]						
NYS	32.88	10.63	Advanced Micro Devices	30.13	0.75	2.6
NYS	27.00	9.75	Analog Devices Inc.	27.00	2.00	8.0
OTC	37.75	10.50	Atmel Corp (H)	37.75	3.50	10.2
OTC	6.25	2.75	Chips and Technologies	5.50	0.63	12.8
OTC	39.75	13.00	Cirrus Logic	34.13	7.00	25.8
NYS	16.75	7.88	Cypress Semiconductor Corp	12.75	0.25	2.0
NYS	19.00	10.38	Dallas Semiconductor	18.25	1.38	8.1
OTC	68.38	30.58	Intel Corp	68.58	3.63	5.6
NYS	19.25	5.38	LSI Logic Corp.	17.88	0.38	2.1
OTC	25.75	11.66	Lattice Semiconductor	25.25	2.00	8.0
NYS	62.25	14.38	Micron Technology (H)	62.25	4.00	6.9
NYS	99.11	41.58	Motorola Inc.	98.25	6.13	8.0
NYS	20.88	10.13	National Semiconductor	20.63	0.25	3.8
OTC	15.75	6.50	Sierra Semiconductor	7.75	0.50	6.9
OTC	51.75	25.50	SynOpsys	48.75	2.61	5.7
NYS	84.25	39.00	Texas Instruments	78.75	2.63	3.4
OTC	18.63	6.50	VLSI Technology (H)	18.63	1.50	8.8
OTC	13.75	1.00	Weitek (H)	13.75	1.00	7.8
ASE	9.62	3.63	Western Digital Corp	5.00	0.13	2.0
OTC	47.25	14.60	Xilinx	47.25	3.00	6.8
OTC	35.50	18.00	Zilog Inc (H)	18.50	3.00	9.2
[illegible]						
OTC	48.00	15.75	American Power Conversion	42.75	4.00	10.3
OTC	21.58	15.50	BancTec Inc.	25.38	7.13	11.0
OTC	18.00	3.50	Cambex Corp	4.50	0.50	12.5
ASE	18.38	3.88	Cognitronics Corp	4.25	-0.13	-2.9
NYS	25.50	9.00	Conner Peripherals	10.13	0.13	1.3
OTC	28.50	15.00	Creative Technologies Inc.	20.00	0.88	4.8
OTC	30.75	10.50	Data Race Inc. (L)	11.00	-1.75	-13.7
ASE	13.25	4.75	Dataram Corp	8.38	-0.25	-2.9
NYS	36.00	6.00	EMC Corp.	36.00	2.38	7.1
OTC	10.58	5.25	Emulex Corp.	6.75	0.50	8.0
OTC	19.00	13.25	Evans & Sutherland	16.75	0.00	0.0
OTC	20.62	7.50	Exabyte	9.75	0.38	4.0
OTC	34.00	9.13	Intelligent Info. Systems	26.75	0.75	2.9
OTC	8.88	2.50	Iomega Corp (L)	2.63	-0.58	-12.5
OTC	15.25	5.75	IPL Systems Inc.	2.00	-0.25	-3.4
OTC	24.00	14.25	Komag Inc.	16.38	0.13	0.8
OTC	19.61	4.38	Maxtor Corp.	5.50	-0.38	-6.4
OTC	10.38	5.75	Micropolis Corp	6.75	0.50	8.0
NYS	117.00	97.00	3M Corp	103.75	-4.00	-3.7
OTC	2.75	4.00	Printronix Inc.	2.63	0.50	7.0
NYS	17.25	6.88	QMS Inc.	9.00	1.13	14.3
OTC	17.88	9.50	Quantum Corp.	50.88	-0.50	-4.4
OTC	7.13	3.13	Radius Inc.	4.50	-0.13	-2.7
NYS	18.88	9.13	Recognition Equipment	16.13	0.50	3.2
OTC	13.88	3.75	Reson Inc.	4.13	-0.13	-2.9
OTC	22.38	12.00	Seagate Technology	18.63	1.00	5.7
NYS	45.00	18.00	Storage Technology	25.88	-1.81	-5.9
NYS	27.88	17.61	Tektronix Inc.	24.38	0.25	1.0
NYS	88.88	70.13	Xerox Corp. (L)	71.50	-0.25	-0.3
[illegible]						
OTC	23.75	14.88	American Mgmt. Systems	14.50	0.38	2.1
NYS	4.25	2.38	Anacomp Inc	3.00	0.13	4.3
OTC	35.75	17.75	Analysts Int'l	32.25	-0.50	-1.5
NYS	56.13	44.63	Auto Data Processing	51.58	2.58	4.8
NYS	17.75	11.00	Ceridian Corp (H)	17.50	0.12	0.7
NYS	17.38	13.13	Comdisco Inc	16.00	-0.13	-0.8
OTC	11.00	4.50	Computer Horizons	10.50	-0.50	-4.5
NYS	92.38	85.88	Computer Sciences	91.75	1.75	1.9
NYS	9.25	6.00	Computer Task Group	7.00	0.00	0.0
NYS	40.50	19.00	CompUSA Inc.	30.58	-0.38	-1.2
OTC	14.25	7.00	Corporate Software	11.00	-0.25	2.2
OTC	12.75	6.62	Egghead Discount Software	7.00	-0.11	-1.6
NYS	35.88	26.00	General Motors E (EDS)	32.00	0.00	0.0
OTC	25.50	10.50	Inacom Corp.	16.50	-1.13	-6.4
OTC	19.88	8.13	Intelligent Electronics	19.88	0.38	1.9
OTC	15.11	7.13	Merisel	14.75	0.88	6.3
OTC	24.50	5.75	Microage Inc	21.63	0.12	0.6
OTC	33.00	19.00	Paychex	31.25	-0.75	-2.3
NYS	87.25	21.63	Policy Management Sys.	36.50	1.38	5.5
NYS	41.63	20.75	Reynolds and Reynolds	39.25	0.88	2.3
OTC	19.00	12.13	SEI Corp	18.38	0.38	2.1
OTC	24.58	17.50	Shared Medical Systems	21.58	-0.50	-2.3
OTC	12.63	5.75	SHL Systemhouse	9.88	0.13	1.3
OTC	30.75	20.00	Software Spectrum Inc.	75.25	0.00	0.0
OTC	80.75	23.75	SunGard Data Systems	38.25	0.00	0.0
NYS	4.38	1.13	Ultimate Corp	3.38	0.63	22.7

KEY (H) = New annual high reached in period (L) = New annual low reached in period
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Briefs

Investors eye Wang

As expected, Wang Laboratories, Inc. emerged from Chapter 11 bankruptcy protection last week. But in a last-minute surprise, two investment firms filed sealed bids with the court for the right to buy new stock from Wang in a private sale, producing a better deal than Wang had signed with one of the firms in August. Wang said it expects to return to profitability next quarter.

Oracle posts profit

For its first fiscal quarter of 1994 ended Aug. 31, Oracle Corp. said revenue increased 30% to $398 million from $307 million in the same period a year ago. Net income for the period rose 275% to $37 million, compared with net income (before a onetime accounting charge) of $10 million in the same period a year ago.

TSC revenue drops

Following the surprise ouster of its two top executives earlier this month, Chicago-based Technology Solutions Co. last week reported that its first-quarter revenue fell 12%, from $15.5 million to $13.8 million from a year ago. The systems integrator did post increases in both net and operating income for the quarter.

Buyout afoot

Digital Communications Associates, Inc. (DCA) in Alpharetta, Ga., has approved a $195 million takeover bid from Welsh, Carson, Anderson & Stowe and Donaldson, Lufkin & Jenrettes' a Sprout Group. The acquiring firms will pay $18.75 for each of DCA's 10.1 million outstanding shares of common stock.

Record earnings

For its first quarter ended Aug. 31, 3Com Corp. reported net income of $26.1 million, up 78% from the year-earlier period. Sales for the quarter increased 20% to $162.1 million from the comparable period last year.

Internetworking Darwinism

Some vendors suffer as market evolves

By Joanie M. Wexler

The salad days of many internetworking companies are waning as the shakeout that so often signals a maturing market rears its head.

The main evidence of the shifting tides: the out-of-orbit financials reported by top-tier vendors such as Cisco Systems, Inc., Wellfleet Communications, Inc., Cabletron Systems, Inc. and SynOptics Communications, Inc., compared with multiple-quarter downturns for technology-savvy but less pervasive companies such as Proteon, Inc., Ungermann-Bass, Inc. and Retix.

The dynamics of the network equipment industry, in which players were once prolific almost in spite of themselves, are shifting in step with user buying patterns to allow the "rich to get richer and the poor to get poorer," several analysts said.

Translation: The router and smart hub powerhouses that early on muscled their way into reams of corporate accounts are continuing to prosper at a dizzying pace — one that is accelerating as customers move toward enterprisewide, rather than departmental, purchase decisions.

These companies' early infiltration strategies have sewn up a lot of business for the future. And in many cases, that success will shut out smaller players regardless of what whizbang features these competitors might add to their products.

"Customers are now buying a 'company,' not just a product," said Todd Dagres, vice president of data communications research at The Yankee Group, a Boston consultancy. "Buyers are going with who is safe and looking at how much they're spending on R&D."

These attitudes serve to fuel the successes of the already aspiring vendors, he said.

This is reflected in the polar financials that have market leaders enjoying double-digit percentage growth rates in their stock prices while their second-tier counterparts suffer double-digit percentage losses (see chart above).

Facing the music

With these figures in mind, as a customer, "are you going to be the one to explain if you go with a vendor who isn't mainstream, and they run into trouble?" said Robin Layland, principal consultant at Layland Consulting in West Hartford, Conn., and former network planner at The Travelers Corp.

Hub giant Cabletron attributed much of its success to its notorious tightfistedness. "When times get tough, the guys in the best position will be those who are in best control of their costs and can still deliver," Cabletron Chairman Craig Benson said.

Rival SynOptics predicted some shakeout because companies focused on a single technology are headed toward commodity markets. While SynOptics infiltrated the Ethernet-over-unshielded copper wiring (10Base-T) market ahead of standards, "six months after the standard, there were probably 200 companies offering 10Base-T hubs," said Gary Law, director of business alliances at SynOptics.

"This drove the cost down, leaving no margins for vendors with nothing else to sell and no money to expand into other areas," Law said.

Some firms, such as 3Com Corp. and Ungermann-Bass, have acquired other hub companies to fill in product gaps.

The more things change

As exemplified in the smart hub market, the rich are getting richer as consolidation and new user buying patterns kick in

Company	Stock price Sept. 28, 1992	Stock price Sept. 28, 1993	Percent change
[illegible]	14⅛	27	91%
[illegible]	26⅜	49⅞	89%
[illegible]	14*	25½	82%
[illegible]	62⅜	103	65%
[illegible]	5⅛	4½	-12%
[illegible]	18⅝	10¼	-44%
[illegible]	24⅞	14	-44%
Proteon Inc.	10⅛	5	-51%

*SynOptics' 1992 stock price is adjusted to reflect a 3-for-1 stock split in early 1993.

European woes

The last two quarters have been "very difficult" for Ungermann-Bass, according to Chief Executive Officer Ralph Ungermann, who resigned in July. He attributed the firm's problems to its traditional focus on a high-end market turned sluggish and a poor economic climate in Europe, once fertile ground for Ungermann-Bass.

Retix, too, attributed its 15.2% net loss for its second fiscal 1993 quarter ended July 3 to a weak European economy. The company, known initially for its Open Systems interconnect business, hopes to pick itself up in the third quarter with its foray into the telecommunications market.

Retix recently became partners with McCaw Cellular Communications, Inc. to provide the internetworking component of that company's cellular network.

Like Retix, struggling vendors "have to reinvent themselves and find a product or concept that people don't know they need yet, then create the need," Dagres said.

In the case of Proteon, long a strong technology player credited with inventing several technologies and driving many networking standards, "merchandising has become more important than it ever was before, and technology [competence] is assumed," said Elliott Honan, acting president since longtime President Patrick Courtin abruptly resigned in July. The company, which has reorganized into two independent business units, one on LAN adapters and one on internetworking products, "will get better at selling," he vowed.

Cisco mates for market advantage

With time to market a burning issue in the computer networking arena, vendors are busy buying out or partnering with others to quickly gain expertise, technology and products. The smaller partner's payoff is typically access to the more pervasive vendor's account base.

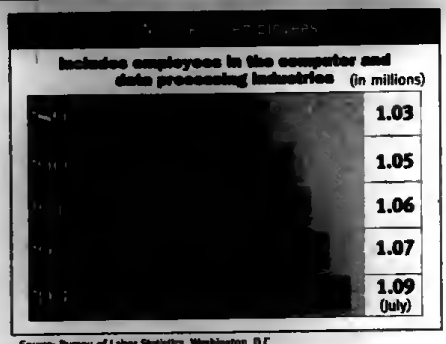
A recent example is Cisco's intended acquisition, announced last week, of start-up Crescendo Communications, Inc., a Sunnyvale, Calif., vendor of high-speed workgroup connectivity products. Cisco plans to buy the 60-person company for 2 million shares of Cisco common stock, which closed at $47.25 per share at press time last week.

For Cisco, the main impetus behind the buy was the router giant's quest for LAN-switching technology, said Paul Homburger, manager of business development.

That represents the next generation of high-speed internetworking, which analysts said will first coexist with, and eventually supplant, routing technology.

"There has been an increasing gap in the performance of workstations and networks," said George Kelly, principal at Morgan Stanley & Co., a New York financial analysis firm. "I think Cisco saw that teaming with Crescendo would give them multiple ways to solve the bandwidth bottleneck problem."

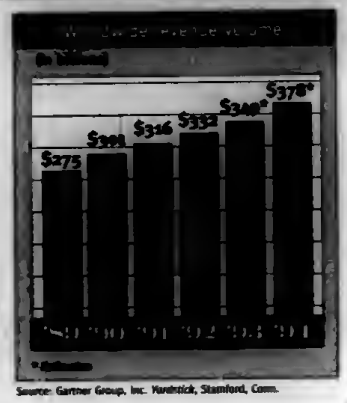
— *Joanie M. Wexler*



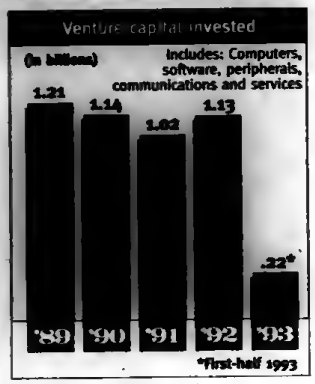
Source: Bureau of Labor Statistics, Washington, D.C.

FCC rules on wireless

The Federal Communications Commission last week finally ruled on how the radio spectrum will be divided up among the wireless network service providers that support personal communications systems (PCS). The agency allocated 160 MHz of spectrum to PCS and said the country would be carved up into 51 regional "major trading areas," each to receive two 30-MHz slices of the radio spectrum. These major areas would be divided into more than 450 "basic trading areas," usually cities; each would receive seven PCS licenses, one 10-MHz and one 20-MHz spectrum band.



Source: Gartner Group, Inc. Yankelick, Stamford, Conn.



Source: Technologic Partners, New York

The 5th Wave *by* Rich Tennant

Inside Lines

Managing the internetwork

Novell plans next week to announce its long-awaited distributed version of NetWare Management System (NMS). Anticipated are a suite of system and network management applications that are expected to run as NetWare Loadable Modules (NLM) for managing distributed NetWare LANs and servers. The NLMs will be able to talk to one another to correlate data on an as-needed basis. Currently, all data goes to a Windows-based system, clogging the internetwork and raising user concerns about scalability. Mid-1994 seems to be the best-case scenario for shipment, a third-party source said. Meanwhile, Novell will introduce Rmon support so that NMS can collect Rmon-based LAN traffic and error data from a fleet of Novell's LANalyzer nodes.

Five's alive

Digital plans to introduce its long-promised Pathworks Version 5.0 LAN software next week at Networld. Due out by the end of the year, Version 5.0 includes a redesigned graphical user interface and a new ManageWorks component for managing native Novell NetWare and Microsoft LAN Manager servers from a client PC without a Pathworks server on Digital hardware. Digital wants to use ManageWorks to position Pathworks as a tool for integrating management of mixed LANs across a corporation in hopes of moving the software beyond the company's installed base. Some analysts remain skeptical about its chances on that score, however.

Partners of necessity

IBM has a "pre-alpha" version of its portable DB2 up and running under Windows NT in its Toronto laboratories, according to one source. Microsoft reportedly "is very interested" in seeing the project completed, as it might give Windows NT a *Good Housekeeping*-like "seal of approval" for many IS organizations already familiar with host DB2. The product, however, needs a lot of work before it gets to be a candidate for a serious beta release.

Can we "hawk"?

Yet another user body is about to take a crack at that most irksome and amorphous of subjects: What do corporate users really want out of a network management system, and how do they get vendors to start providing the products to fill those needs? The Oct. 11-12 meeting of the Open User Recommended Solutions consortium in Boston will see the formation of a network management task force, whose founding members will be EDS, Pacific Gas & Electric, Intel, IBM and Legent.

Sprouting services

Banyan will announce this week at its ABUI user group meeting, and then at Networld the following week, the data and application distribution service it hinted at a couple of weeks ago [CW, Sept. 13]. The service will automatically move data or software updates from one disk or PC to another across a distributed enterprise network that can include Novell's NetWare, Banyan's Vines and Unix systems. While Microsoft's Hermes and Novell's Network Navigator will provide software distribution, this is the first data distribution package integrated with network operating systems; it is much-needed by corporate client/server installations, our source tells us.

A joke making the rounds at Unix Expo attempted to explain why Novell failed to announce last week that it was donating its Unix system specifications to X/Open Co. as a trademark form of Unix (see story page 14). Many vendors and industry groups were consulted in a furious round of discussions during the last week, the story goes. "The way I heard it described," one industry analyst said, "they went through the entire agreement from A to Z, and when they got to Z, it finally fell apart — and the Z stands for Xander," Ed Xander is president of Sun's SunSoft business unit, which sells its own Unix implementation, Solaris 2.X. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 70537,2412, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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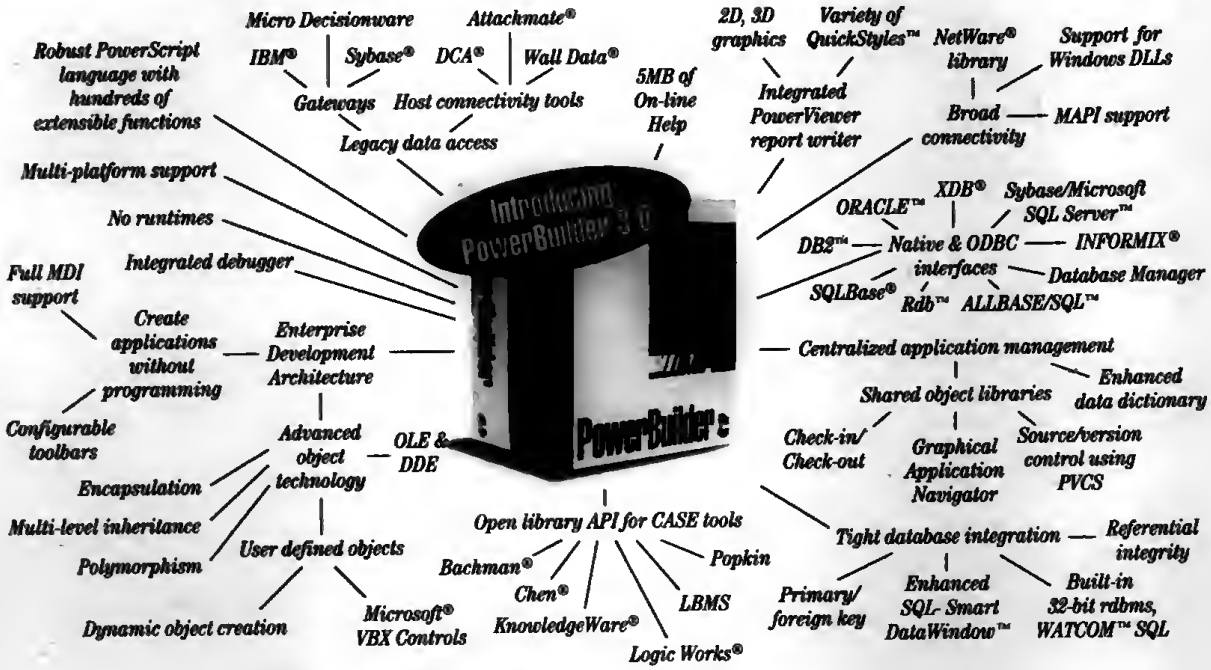

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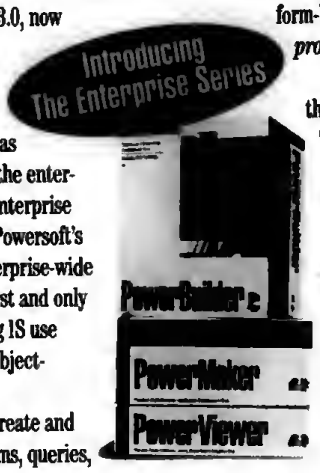

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